

Site: Lee's Lane Ldfl
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FIVE-YEAR REVIEW REPORT

Fourth Five-Year Review Report
for
Lee's Lane Landfill
Louisville
Jefferson County, Kentucky

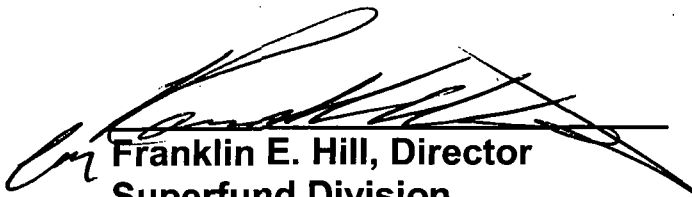
September 2008

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For
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List of Acronyms

ACL	Alternate Concentration Limit
AOC	Administrative Order of Consent
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
ATV	All-Terrain Vehicle
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFS	Cubic feet per second
CSM	Conceptual Site Model
CWA	Clean Water Act
DQO	Data Quality Objective
DWS	Drinking Water Supply
EDD	Enforcement Decision Document
ELG	Effluent Limitations Guidelines
EM-CX	Environmental and Munitions Center of Expertise
EPA	United States Environmental Protection Agency
CAG	Cancer Advisory Group
CFR	Code of Federal Regulations
HRS	Hazard Ranking System
HTRW	Hazardous, Toxic, Radiological Waste
IC	Institutional Controls
KEPPC	Kentucky Environmental and Public Protection Cabinet
LEL	Lower Explosive Limit
LFG	Landfill Gas
MACT	Maximum Achievable Control Technology
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MSA	Metropolitan Statistical Area
MSD	Metropolitan Sewer District
MW	Monitoring Well
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OMS	Ohio Main Stem
RA	Remedial Action

RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SAD	Surveillance and Analysis Division of the Kentucky Division of Waste Management
SCS	SCS Engineers
SDWA	Safe Drinking Water Act
SMCL	Secondary Maximum Contaminant Level
TBC	To Be Considered
USACE	United States Army Corps of Engineers
UST	Underground Storage Tank
WAH	Warm Water Aquatic Habitat

Executive Summary

The remedy for the Lee's Lane Landfill in Louisville, KY included operation and maintenance of a subsurface gas collection system, provision of alternate water supplies, removal of exposed drums, capping soils in hot spot areas, imposition of site security measures, and monitoring of groundwater, gas, and air. The Site achieved construction completion on March 18, 1988. Operation and Maintenance (O&M) activities at the Site were transferred to the Louisville Metropolitan Sewer District (MSD) in 1991. On April 7, 1994, the Commonwealth of Kentucky and EPA entered into a Cooperative Agreement under which the oversight of O&M of the Remedy were to be assumed by the Commonwealth. The trigger for this fourth five-year review was the completion of the third five-year report, dated July 02, 2003.

The assessment conducted for this Five-Year Review found that the remedy was constructed and was operated and maintained in accordance with the requirements of the Enforcement Decision Document (EDD) through 2003. The remedy at the Lee's Lane Landfill is currently protective of human health and the environment. However, as a result of blockage in the landfill gas collection system causing the system not to function properly, levels of methane gas have been increasing at one of the five gas monitoring wells (gas monitoring well G-1). According to the Site Operations and Maintenance Manual, values above the 10% LEL should trigger the need for continuous monitoring and above the 25% LEL should trigger evacuation of site workers at the landfill. So far, methane levels have not exceeded these criteria at the Site.

To ensure that the remedy will be protective in the long-term, the 2003 Five-Year Review report recommended a complete re-evaluation of the subsurface gas collection system. The re-evaluation was conducted in February 2004. Results included findings of loss of vacuum throughout the majority of the landfill gas collection system and relatively high concentrations of methane at Well G-1, which is one of the Site's five gas monitoring wells. The evaluation concluded with recommendations for system repair; however no repairs to the system have been made to date.

Effectiveness of current access restriction at the Site and protection of the landfill cap need to be re-evaluated relative to pedestrian traffic along the river adjacent to the landfill and uncontrolled all-terrain vehicle (ATV) traffic around the landfill. The gate to the site at Lee's Lane was found unlocked and wide-open on one neighborhood visit.

The main recommendation in this report is that corrections to the landfill gas collection system must be made so that it functions effectively. Other recommendations are to reestablish an information repository for the public, to increase restriction to unauthorized access at the Site, and to abandon or protect the groundwater monitoring wells that are no longer servicing the Site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Lee's Lane Landfill		
EPA ID (from WasteLAN): KYD980557052		
Region: 04	State: KY	City/County: Louisville / Jefferson
SITE STATUS		
NPL status: Deleted 04/25/96		
Remediation status : Complete		
Multiple OUs?* NO	Construction completion date: 03/18/1988	
Has site been put into reuse? NO		
REVIEW STATUS		
Lead agency: US EPA, Region 4		
Author name: Karen Rabek		
Author title: Project Scientist	Author affiliation: US Corps of Engineers	
Review period:** 01/15 /2008 to 03 /30 /2008		
Date(s) of site inspection: 02/ 26/2008		
Type of review: Statutory		
Review number: 4		
Triggering action: Previous Five-Year Review Report Date		
Triggering action date (from WasteLAN): 07 / 02 / 2003		
Due date (five years after triggering action date): 07 / 02 / 2008		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd

Issues:

- As recommended by the 2003 Five-Year Review, inspections of the Landfill gas (LFG) collection System were performed by SCS Engineers (SCS) in February and March 2004. Blockages were found in the system. Levels of methane are increasing relatively at one of the five gas monitoring wells at the Site. However, the levels are still well below action levels. Several of the extraction wells were found to hold standing liquid or were under water. SCS recommended pumping out the liquids in the wells to restore the ability of the wells to function properly and possibly eliminate the need to install replacement wells.
- Although MSD indicated that many feasible measures have been taken to provide site security, the presence of pedestrian path along the levee top and the large amount of uncontrolled quad-runner ATV traffic require that MSD, the City of Louisville, and the EPA further consider the effectiveness of current access restriction at the Site. This is necessary to maintain the integrity of the landfill cap.
- Part of the review is to ensure that documents, reports and other information are available at a nearby public repository. Site reports are not available currently at a local repository.
- Groundwater monitoring wells A, B, and 02 were removed from the monitoring program at the Site but were not plugged and abandoned. The wells could potentially cause extraneous contaminants to gain access to the groundwater.

Five-Year Review Summary Form, cont'd

Recommendations and Follow-up Actions:

1. Repair the landfill gas collection system so that it functions properly and more efficiently. Continue to maintain methane levels at an acceptable level.
2. Re-evaluate Site access restriction measures in view of the pedestrian and uncontrolled quad-runner ATV traffic.
3. Re-establish a repository for project information locally.
4. Plug and abandon or protect the monitoring wells which are no longer part of the monitoring program to alleviate the potential for undue groundwater contamination.

Protectiveness Statement:

The remedy at the Lee's Lane Landfill continues to be protective of human health and the environment. However, because of the blockage in the landfill gas collection system causing the system not to function properly, levels of methane have been rising in one of the five gas monitoring wells but still remain below action levels. The system needs to function properly to continue preventing the migration of explosive gases from the landfill to the nearby sub-division. Therefore, repairing the system as soon as possible will ensure that the remedy remains protective of human health and the environment in the long-term. In addition, improved access restriction measures at the Site will prevent pedestrian and quad-runner ATV traffic effectively to maintain the long-term integrity of the landfill cap.

Five-Year Review Report

I. Introduction

The Purpose of the Review

The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, and make recommendations to address them.

Authority for Conducting the Five-Year Review

The Agency is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

Who Conducted the Five-Year Review

As the lead agency, U.S.EPA Region 4 formed a team consisting of the Remedial Project Manager and U.S. Army Corps of Engineers (USACE) Engineering staff to conduct the Five-Year Review. Personnel of the U.S. Army Corps of Engineers, Karen Rabek and Nathaniel Peters of the Louisville District, assisted EPA in conducting this Five-Year Review of the remedial actions implemented at the Lee's Lane Landfill in Louisville, KY. The review was conducted from January 2008 through July 2008. This report documents the results of the review. Support of the US Army Corps of Engineers for this review was provided for under EPA Work Authorization Form of Interagency Agreement (IAP) No. DW96945884.

Additionally, Mr. Richard Watkins of the Louisville Metropolitan Sewer District, who performs O & M on the Site, provided much support for this review. Mr. Scott Smith of the Smith Management Group, Inc. provided assistance during the inspection. A full list of site inspection participants is provided in Attachment C-1.

Other Review Characteristics

The Site has one operable unit (OU) that will be discussed in this report. The one operable unit addresses soil, sediment, surface water and groundwater contamination at the site. Several removal and remedial actions have been completed at this Site and operations and maintenance and groundwater monitoring activities are ongoing.

This is the fourth Five-Year review for the Lee's Lane Landfill. The triggering action for this review is the final report of the Third Five-Year Review dated 07/02/03. This is a statutory five year review, which, in accordance with CERCLA §121 and the NCP, is triggered by remedial action that leaves hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and restricted exposure.

Since the landfill waste was, for the most part, left in place, the selected remedy requires continual operation of a subsurface gas collection and venting system to prevent migration of landfill-generated gas into an adjacent residential area. Additionally, ground water wells, gas wells, ambient air, settlement plates, and surface conditions are monitored to determine the adequacy of the site's remedial measures. A review of the Site remedy is required to be conducted at least every five years. The next Five-Year Review will be required in September 2013.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Flash fires around residential water heaters due to migration of methane gas from the landfill	Early 1975
Gas subsurface venting system installed by KY Dept of Hazardous Materials and Waste Management	10/1980
Listed on NPL	09/08/1983
Preliminary Assessment	08/01/1984
Remedial Investigation/Feasibility Study complete	04/1986
Record of Decision (ROD)	09/25/1986
Enforcement Decision Document (EDD)	09/25/1986
Remedial Design, Start and Complete	03/20/1987, 03/31/1988
Remedial Action, Start and Complete	03/16/1987, 10/27/1987
Closeout Report	03/18/1988
EPA completed response actions according to EDD	03/18/1988
O&M transferred from EPA to MSD	07/16/1991
1 st Five-Year Review Report	03/11/1993*
Site Review and Update by ATSDR	09/30/1993
Oversight of MSD's O&M transferred to KEPPC	04/07/1994
Delisted from NPL	05/01/1996
2 nd Five-Year Review Report	06/30/1998*
3 rd Five-Year Review Report	07/02/2003
SCS Engineers performed inspection of the LFG collection system	02/02/2004 to 03/26/2004
Investigation of the LFG collection system - SCS Letter report	05/06/2004

Dates on documents differ from those listed in CERCLIS

III. Background

Physical Characteristics

The Lee's Lane Landfill site is located in the City of Louisville, Jefferson County, Kentucky and is 112 acres in size. The Site is located on the southeast bank of the Ohio River from approximate river mile 615.35 to 616.2 and lies between the river and the Louisville Levee. The Site location is shown on Figure 1, and a recent aerial view of the landfill is provided as Figure 7. The entire site is approximately 5,000 feet long and 1,500 feet wide. As indicated on Figures 2 and 3, the landfill is divided into three portions, a northern tract, central tract, and southern tract. The Northern and Central Tracts of the landfill consist of level to gently sloping land, while the Southern Tract contains two depressions with steep slopes. Much of the landfill surface is covered with well-established vegetation ranging from brush to woodlands. Elevations range from 383 feet above mean sea level along the Ohio River to 461 feet at the top of the levee. The geology of the Site consists of approximately 110 feet of Ohio River alluvium (20 – 30 feet of silts and clay over 80-90 feet of sand with varying amounts of gravel), see Figure 6. Underlying the river alluvium is the New Albany Shale. The alluvial aquifer is unconfined with the shale forming an aquitard between the alluvial aquifer and the deep limestone aquifers. The water table is approximately 50 feet below the surface. Flow in the aquifer is predominantly toward the Ohio River. During periods of high river flow, however, groundwater flow direction may reverse. Water levels in the aquifer vary with fluctuations of the Ohio River.

Land and Resource Use

The landfill is bounded on the northeast by the Borden, Inc. chemical plant; on the southeast by the Louisville Flood Protection Levee and thence the residential area of Riverside Gardens, which contains about 330 homes; on the southwest by the Louisville Gas and Electric Company Mill Creek Pump Plant; and along the northwest boundary by the Ohio River.

The major migration pathway for groundwater is direct discharge to the Ohio River. However if high water conditions on the Ohio River were to exist for a sufficient period of time, groundwater reversal might occur and flow would be towards the Riverside Gardens residential wells. Prior to 1993, there was a small number of private drinking water wells located in the Riverside Garden subdivision. However, since at least 1993, the entire subdivision has been supplied public water by the Louisville Water Company.

Although most of the natural plant communities at the Site have been disturbed, a good secondary growth of grasses and shrubs have developed over the Northern and Central Tracts, while a low-lying area in the Southern Tract has developed into a wetland and open water area. Additionally, a dense growth of vegetation characteristic of riparian woods exists along the Ohio River. The diversity of habitats at the Site suggests the area could contain an abundant faunal population. Small mammals are expected to dominate the woodland and brush areas. These areas would also be conducive to birdlife. Aquatic life in the Ohio River near the Site is dominated by pollution-tolerant species.

History of Contamination

Domestic, commercial, and industrial wastes were disposed of in the landfill from the late 1940s to 1975. Prior to and during its use as a landfill, sand and gravel were quarried at the Site. In 1971, the State of KY permitted the Southern Tract of the landfill under its Solid Waste Program. In 1974, the Lee's Lane Landfill permit expired and, due to repeated compliance violations, was not renewed.

In March 1975, the Jefferson County Department of Public Health was notified of the presence of methane gas and flash fires in some homes in the Riverside Gardens subdivision. As a result of explosive levels of the gas, seven families along the street closest to the landfill were evacuated by the Jefferson County Housing Authority. In April 1975, the KY Natural Resources and Environmental Protection Cabinet filed a lawsuit against the landfill owners. This resulted in the closure of the landfill in the same year.

Initial Response

Between 1975 and 1979, 44 gas observation wells were installed in and around the landfill and in Riverside Gardens to monitor the concentration, pressure and lateral extent of methane gas migration. Samples collected from these wells indicted that the source of the methane and associated toxic gas was the decomposition of landfill wastes. In October 1980, a gas collection system was designed and installed on the Site by SCS Engineers, between the landfill and Riverside Gardens.

In November 1978, the Surveillance and Analysis Division (SAD) of the Kentucky Division of Waste Management collected samples from residential wells in Riverside Gardens to determine the potential effects of the landfill on groundwater quality. As a result of the study, the SAD reported that there was no indication of the migration of contaminated groundwater from the landfill to the residential wells near the landfill.

In February 1980, the KY Department of Hazardous Materials and Waste Management discovered approximately 400 drums within the landfill about 100 feet from the Ohio River bank on a 10-foot vertical rise above the river. In September and October of 1981, the drums were removed by the landfill owners under Court Order. The wastes were removed from the drums and transported to an approved hazardous waste disposal facility. The remaining non-hazardous drummed materials and empty drums were buried onsite within the landfill.

In early 1981, the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) (later reorganized and called the Kentucky Environmental and Public Protection Cabinet (KEPPC)) installed eleven shallow groundwater monitoring wells at the Site. Five of these were later sampled by EPA. Analyses of the samples indicated that the on-site groundwater contained inorganic contaminants including arsenic, lead, and chromium at elevated concentrations. However the results were believed to be affected by the presence of sediment in the wells, apparently due to improper well installation.

Basis for Taking Action

In December 1982, the EPA evaluated the Lee's Lane Landfill Site using the Hazard Ranking System (HRS) as described in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The overall score was 47.46 which ranked the Site high enough to be placed on the National Priorities List (NPL). The NPL is a list of priority releases for long-term evaluation and remedial response, and was promulgated pursuant to section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended. The NPL list is found in the NCP (Appendix B of 40CFR part 300). The Site received a high score because of its distance from the nearest population (300 feet), the floodway location, the identification of landfill hazardous wastes, particularly chromium and vinyl chloride, and the close proximity to the nearest well in Riverside Gardens.

The Remedial Investigation/Feasibility Study (RI/FS) completed in April 1986 by the NUS Corporation concluded as follows:

- The remedial investigation identified contaminants in the following media: surface water, soil, and groundwater. Onsite surface water contained very low levels of contaminants. Onsite soils and sediments were similar to the offsite background sample collected in riverside gardens, suggesting the use of local soils as cover material. Typical offsite soil concentration levels included arsenic (24 mg/kg), barium (92 mg/kg), chromium (20 mg/kg), lead (50 mg/kg), manganese (1200 mg/kg) and iron (35,000 mg/kg). In two areas where "hot spot" soil samples were collected, the estimated concentrations of lead and chromium were 2000 mg/kg (ppm) each. These areas were located along the access road in the central tract. They were believed to be the result of indiscriminate dumping since the concentrations found were not representative of overall soil concentrations.
- Onsite groundwater contained low levels of organic compounds and some inorganic contaminants. The major inorganic contaminants included arsenic (87 ug/l), barium (1,100 ug/l), cadmium (22 ug/l), chromium (60 ug/l), lead (150 ug/l), manganese (44,000 ug/l) and iron (190,000 ug/l). The offsite concentrations of these contaminants were all below the maximum contaminant levels (MCLs) set in the interim primary drinking water standards at the time of the ROD. Manganese was detected at 610 ug/l in the Louisville Gas and Electric well and at 370 ug/l in an Indiana PWS well, but was below background in both industrial wells. Neither manganese nor iron was considered to have significant health effects.
- From the contaminants detected in the RI, lead, arsenic, benzene and chromium were selected as critical contaminants for further evaluation. This selection was based on the frequency of detection and/or chemical, biological, and toxicological properties.

The table below from the 1986 ROD provides a summary of the range of concentrations found in the various media at the Site.

**Table 2: Critical Contaminant Levels in Various Media at the Lee's Lane Landfill Site
Jefferson County, Kentucky**

Critical Contaminant	Groundwater ug/L	Surface water ug/L	Bottom Sediments mg/kg	Surface Soil mg/kg
Lead	0 - 150	0 - 10J	10J - 100J	50J - 2,000J
Arsenic	0 - 87	0	5.4 - 27	0 - 25
Benzene	0 - 450	0 - 5J	0 - 15J	0
Chromium	0 - 640	0 - 6.2	9.8 - 30J	10J - 2,000J

J – Estimated value

0 – Not detected

- The onsite migration pathways consisted of surface water infiltration to groundwater in the Northern and Central Tracts, with minimum runoff and ponding except during major storms and floods. Surface water infiltration was also expected in the Southern Tract, but runoff to the large pond was a probable pathway due to the steep slopes.

- Onsite surface water contained very low levels of contaminants. Onsite soils and sediments were similar to the offsite background sample collected in Riverside Gardens, suggesting the use of local soils as cover material. In two areas where "hot spot" soil samples were collected, the estimated concentrations of lead and chromium were 2,000 mg/kg each. These areas were located along the access road in the Central Tract and were believed to be the result of indiscriminate dumping since the concentrations found were not representative of overall soil concentrations.

- The major migration pathway for groundwater was direct discharge to the Ohio River. The groundwater discharge from the landfill to the Ohio River was estimated at 0.0015 % of the total Ohio River flow. If high water conditions on the Ohio River were to exist for a sufficient period of time, groundwater reversal might occur and flow would be toward the Riverside Gardens residential wells. Additionally, the effects of contaminant migration under the Ohio River were expected to be inconsequential.

- Onsite groundwater contained low levels of organic contaminants and some inorganic contaminants. The major inorganic contaminants included arsenic, barium, cadmium, chromium, lead, manganese, and iron. The offsite concentrations of these contaminants were below the maximum contaminant levels (MCL) set in the Interim Primary Drinking Water Regulations. Neither manganese nor iron was considered to pose significant health risks.

- The IT Corporation evaluated the existing subsurface gas collection system in 1984 and concluded that the gas collection system was operating at less than 50% efficiency. Gas monitoring indicated, however, that the gas collection system was still mitigating gas migration. In November 1985, the Jefferson County Department of Public Works contracted SCS Engineers to inspect the gas collection system. Repairs of problem areas noted were completed in 1986.

- In September 1993, a public health assessment was prepared by ATSDR. The ATSDR public health assessment concluded the following: that the primary health concern at the Site was the elevated chromium levels found in onsite groundwater. Need for groundwater remediation was not indicated by the public health assessment. However, long-term monitoring of groundwater and ambient air was recommended to establish baseline conditions and to serve as an early detection system should site conditions change.

- There was no evidence of an offsite public health or environmental problem related to the Site based on available information.

- The public health assessment indicated that the existing gas collection system was mitigating gas migration, but that the system needed to be repaired or replaced. A routine subsurface gas monitoring program also needed to be implemented outside the collection system and in Riverside Gardens.

- The public health assessment also noted that, in the absence of controlled access to the Site, the surface wastes should be removed and the soils containing elevated levels of chromium and lead should be covered.

IV. Remedial Actions

Record of Decision Document

The EPA determined in the 1986 ROD that a remedial action was necessary for groundwater. A remedy was selected in the ROD from several potential alternatives, based on a detailed analysis of each alternative and on public and state comments.

The ROD for the Lee's Lane Landfill was signed on September 25, 1986. Remedial Action Objectives (RAOs) were developed as a result of data collected during the RI that supported the ROD. The RAOs for the Lee's Lane Landfill Site are as follows:

1. Construct a groundwater monitoring program that will serve as an early warning system should site conditions change.
2. Control the vertical and lateral subsurface migration of methane and other gases.
3. Institute a routine monitoring program that will serve to detect any undesirable and possible dangerous levels of methane and/or toxic vapors migrating into the Riverside Gardens neighborhood.
4. Institute an ambient air monitoring program.

The selected remedy within the ROD specified the following remedial actions (RA) for the entire Site:

- A multi-media monitoring program to provide information so that possible adverse public health or environmental impacts that may arise can be addressed. Based upon the conclusions of the remedial investigation (RI), gas migration is considered a significant problem at the site. Therefore, at a minimum, an air monitoring program would be implemented followed by the installation of gas monitoring wells, and implementation of the gas and groundwater monitoring programs.
- The monitoring program contains provisions for the sampling of an additional groundwater monitor well to aid in determining alternate concentration limits (ACLs). If it can be demonstrated that an ACL will not pose a substantial present or potential hazard to human health or the environment, then corrective action is not required. The current groundwater conditions do not present an immediate threat to the public health and the environment. Based on the hydrogeology at the site, it is expected that two years of groundwater data will have to be assembled before the ACL demonstration process can be initiated.
- The provision of a properly operating gas collection system, consideration of a future alternate water supply, cleanup of the surface waste areas, and bank protection controls.

- Surface waste cleanup involving removal of exposed drums, capping of "hot spot" soils and an area containing exposed trash. The drums would be analyzed prior to excavation and removed to an approved landfill.
- Riprap to minimize erosion potential and failure of the Ohio River embankment.
- The entire bank (29 acres) along the Ohio River would be stabilized.
- Cautionary signs will be posted. One gate would be installed at the Putnam Street access point.
- Operation and maintenance activities include inspection of the gas monitoring wells, quarterly gas and groundwater sampling and analysis, and sampling of air three times per year. Other O&M activities include inspection and maintenance of the gas collection system, capped waste areas, and the riprap along the Ohio River bank.

As noted above, cleanup goals for groundwater were not included within the Lees Lane Landfill ROD, but the potential for installing ACLs at the site two years after the ROD was signed was provided within the 1986 ROD.

Enforcement Decision Document (EDD)

The EPA signed an Enforcement Decision Document (EDD) on September 25, 1986, for the Lee's Lane Landfill. The document provided for the following response actions:

- 1 Inspection, repair, and operation of the gas collection system,
- 2 Provision of alternate water supplies for residences still on wells,
- 3 Removal of exposed drums,
- 4 Capping with soils in "hot spots" in an area of exposed trash and disposal of exposed wastes
- 5 Imposition of institutional controls, including security gates and cautionary signs,
- 6 Construction of a rip-rap slope along the Ohio River bank,
- 7 Repair of an existing drainage ditch and installation of a 20-inch drainage pipe,
- 8 Monitoring of groundwater wells, gas wells, and ambient air, and
- 9 Operation and maintenance activities to include inspection of the gas monitoring wells, the gas collection system, capped waste areas and the riprap along the Ohio River bank.

The EDD also stipulated that two years of groundwater monitoring would be required in order for groundwater ACLs to be established based on demonstration that the ACL will not pose a substantial present or potential hazard to human health or the environment. This review found no subsequent decision document to establish ACLs.

Additionally, monitoring of the gas collection system would be used to ensure that explosive gases within the gas collection system would remain below 25% of the LEL. The Operations and Maintenance Manual stipulated that continuous monitoring is required for explosive gases above 10%LEL, and evacuation of landfill site workers is required if explosive gases reach above 25% LEL.

Remedy Implementation

On March 10, 1987, the EPA initiated a removal action in accordance with the EDD, as described above. The removal action was completed on March 18, 1988.

System Operation/Operation and Maintenance (O & M)

The EPA performed operation and maintenance from July 1988 to June 1989. On July 16, 1991, the EPA issued an Administrative Order of Consent (AOC) (Attachment C-15) under which MSD, agreed to perform certain O&M activities at the Site for twenty-nine (29) years. The AOC also capped MSD's spending on specific repair activities at \$250,000. Maintenance covered by the AOC to be conducted by MSD included:

1. Repair or replacement of riprap;
2. Repair or replacement of cracking, slumping, or other signs and effects of slope movement and installation of equipment for measurement of slope movement;
3. Repair or replacement of the blower house, weather data collection stations, and gates and barriers;
4. Repair of road and on-site roadways;
5. Repair or replacement of clay cap;
6. Repair of blowers and pumps;
7. Repair of equipment damaged by vandalism;
8. Repair of any conditions exposing hazardous substances, or containers which may contain hazardous substances, directly to the elements;
9. Additional sampling to verify unusual analytical results; and
10. Repairs or other activities undertaken to eliminate or reduce ponding of surface waters.

On April 7, 1994, the Commonwealth of Kentucky entered into an Intergovernmental Response Agreement with the EPA. Under the agreement, Kentucky assumed responsibility for the oversight of MSD's O&M activities.

Table 3 below indicates the O & M expenses reported by MSD.

Table 3: Annual System Operations/O&M Costs

O&M Costs		Total Cost rounded to nearest \$1,000
In-House Expenses		
From: 2002	To: 2003	\$33,000
From: 2003	To: 2004	\$87,000
From: 2004	To: 2005	\$48,000
From: 2005	To: 2006	\$13,000
From: 2006	To: 2007	\$25,000
Contractor Costs		
From: 2005	To: 2006	\$32,077
From: 2006	To: 2007	\$28,265

Groundwater sampling is performed annually by Heritage Environmental. The cost has dropped from \$7077 to \$3265 annually because of the recommendations of the 2003 review to drop wells A, B, and 02 from the sampling program. The gas monitoring wells are monitored semiannually by URS for \$12,500 per event.

V. Progress Since the Last Review

Protectiveness Statement from the last Five-Year Review

In the last Five-Year Review, signed on July 2, 2003, the protectiveness statement described the Site as protective of human health and the environment. The full protectiveness statement from the previous five year review report is provided below:

The remedy at the Lee's Lane Landfill currently protects human health and the environment, because it significantly reduces the migration of explosive gases from the landfill and minimizes on-site and off-site exposure to contamination. In order to insure that the subsurface gas collection system continues to function at its current level or better, a re-evaluation of the system will be initiated by December 2003. Although many practical site security measures have been taken, the limits and liabilities of current measures need to be re-evaluated in terms of pedestrian traffic resulting from the recently constructed walking path adjacent to the landfill and uncontrolled trespasser quad-runner ATV traffic within the landfill itself.

Recommendations from the Previous Five Year Review:

The following discussion summarizes the issues and recommendations made in the 2003 FYR and any follow up actions that have been taken to address those recommendations. The recommended actions and accomplishments from the 2003 5YR are shown in Table 4.

Table 4: Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Aging LFG collection system and increases in methane readings	Have system evaluated and repaired or replace components as needed	MSD/ KEPPC	Dec 2003	SCS Engineers performed a maintenance inspection. Blockages in system and relatively high level of methane found in one of five sampling wells. System repairs recommended.	Letter report dated May 6, 2004
All terrain vehicles tearing up landfill grass and cutting into clay cap	Increase oversight by KEPPC	KEPPC	Dec 2003	None	KEPPC presently working out a plan
Pedestrian flow across newly constructed walkway along the levee adjacent to the project; significant trespasser incidence	Re-evaluate Site security measures, limits, and liabilities	MSD/KEPPC	Dec 2003	None	None
No information repository	Have available at MSD	MSD	Dec 2003	Boxes of reports and documents are available at the MSD office	Not officially completed
Blocked ditch and drain pipe under access road	Improve onsite drainage	MSD	Dec 2003	Postponed until gas collection system is repaired	To be determined
Residents on city water, groundwater monitoring not needed	Discontinue groundwater monitoring of groundwater monitoring wells A, B, and 02	MSD	Sep 2003	Wells A, B, and 02 were dropped from the sampling events effective 2007	December 2007
New KY Water Quality Standards	Add laboratory analyses as required for samples from groundwater monitoring wells 04 and 05 to evaluate flow toward river	MSD	Sep 2003	Analyses were added to the data set effective 2007	December 2007

VI. Five-Year Review Process

Administrative Components

In November 2007, the U.S. EPA requested the assistance of the U.S. Army Corps of Engineers in performing the fourth Five-Year review of the subject project. Ms. Karen Rabek, Mr. Nathaniel Peters, and Mr. Shelton Poole of the Louisville District along with Mr. Greg Mellema of the Environmental and Munitions Center of Expertise (EM-CX) held a conference call on January 22, 2008, with Mr. Femi Akindele of the EPA to discuss the project. The following schedule was established:

Document Review	February - Mid March
Data Review	February – Mid March
Site Inspection	February 26, 2008
Initial Draft Report	April 1, 2008
Draft Five-Year Report	April 23, 2008
Final Five-Year Report	June 30, 2008.
Signed report	July 2, 2008

Community Notification and Involvement

On February 28, 2008, the USACE announced that the remedy at the Site was under review in the local newspaper. (See Attachment C-9). Flyers were sent out notifying the residents of the Riverside Gardens neighborhood of the review inviting comments on the activities related to the Site (Attachment C-10). Attempts were made to do in person interviews with residents who were mailed flyers, but none of the residents were available. Questionnaires (Attachment C-11) were left with postage-paid addressed envelopes for twenty-five residents and invited comments on activities related to the Site. No responses to the questionnaires were received. Mr. Richard Watkins of MSD and Mr. Wesley Turner of KEPPC were interviewed by telephone by Karen Rabek of USACE for their comments on the Site activities. Copies of the telephone interviews are found in Attachment C-12.

Document Review

This five-year review consisted of a review of the following documents:

- The Lee's Lane Landfill Remedial Investigation/Feasibility Study (RI/FS), 1986
- Record of Decision, September 25, 1986
- Enforcement decision Document, September 25, 1986
- 1991 Administrative Order of Consent, USEPA Docket No. 91-32-C
- Lee's Lane Operation and Maintenance Plan
- Review of Response Actions at the Lee's Lane Landfill Site, Louisville, KY (First 5-Year Review Report, 1993.
- Second 5-year Review Report, 1998

- Third 5- Year Review Report, 2003.
- SCS Engineers May 6, 2004 investigation letter report
- USACE evaluation of the May 6, 2004 investigation
- MSD Air Quality and Field Observation reports
- Annual O&M reports

ARARs and Risk Assessment Review

The ARARs Review conducted for this report is summarized here. A summary of the initial and current ARARs as provided by the 2003 5-year review are reviewed also to determine any potential for subsequent update.

1. Applicable ARARs for Protectiveness Review:

Section 121 (d) (2) (A) of CERCLA specifies that Superfund remedial actions must meet any federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). ARARs are those standards, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. To-Be-Considered criteria (TBCs) are non-promulgated advisories and guidance that are not legally binding, but should be considered in determining the necessary level of cleanup for protection of human health or the environment. While TBCs do not have the status of ARARs, EPA's approach to determining if a remedial action is protective of human health and the environment involves consideration of TBCs along with ARARs.

Chemical-specific ARARs are specific numerical quantity restrictions on individually listed contaminants in specific media. Examples of chemical-specific ARARs include the MCLs specified under the Safe Drinking Water Act as well as the ambient water quality criteria that are enumerated under the Clean Water Act. Because there are usually numerous contaminants of potential concern for any Site, various numerical quantity requirements can be ARARs. The final remedy selected for this Site was designed to meet or exceed all chemical-specific ARARs and meet location- and action-specific ARARs.

Per EPA Guidance, only those ARARs that address risk posed to human health or the environment need be reviewed. Based on the 1986 ROD, the ARARs associated with the site remedies are as follows:

- 40 CFR Part 264, Subpart F- Groundwater Protection Standards and Alternate Concentration Limit provisions
- 40 CFR Part 141 National Primary Drinking Water Regulations;
- 401 KAR 34:060 Sections 1, 8-12- Groundwater Protection

- 401 KAR 5:031 - Kentucky's Surface Water Quality Standards
- Ohio River Sanitation Commission (ORSANCO) Water Quality Criteria for Chemical Constituents
- 40 CFR Part 50 - 64- Clean Air Act; 401 KAR 50 - 64
- Federal Register Notice. 18287 Federal Register / Vol. 61, No. 81 / Thursday, April 25, 1996 / Rules and Regulations.

The review of ARARs for the groundwater contaminants identified with cleanup goals in the 1986 ROD suggests that federal standards (i.e., MCLs) and state standards for these contaminants have changed for several COCs, as discussed below.

Maximum Contaminant Level (MCL) is defined by 40 CFR Part 141 National Primary Drinking Water Regulations. The MCLs are maximum allowable chemical concentrations for drinking water. There is a change listed for arsenic drinking water standards from the levels for arsenic drinking water standards within the 1986 ROD. In the 1986 ROD, the arsenic drinking water standards were 0.05 mg/L. The arsenic regulations listed in §141.51 and §141.62 are effective for the purpose of compliance on January 23, 2006. The current regulations enforce the arsenic MCL at 0.01 mg/L and a new MCLG at 0.0 mg/L.

State water quality criteria have been used in previous 5-year reviews to establish ACLs using different dilution factors. The 2003 review updated the ACLs based on drought and minimum river flow conditions. This review has selected the drought flow for the new ACLs because it provides more stringent values and which are most protective of human health and the environment. See Table 4.

Some of the Kentucky standards for drinking water have changed during this review period, specifically beryllium, cadmium, chromium (VI), lead (dissolved), selenium, and benzene. Analytical results for benzene has not been reported for groundwater at the Site during this review period, but was included as a criteria pollutant for various media in the EDD. Analytical requirements for cadmium, copper and dissolved lead had detection limits that were above values that meet the State surface water criteria. Beryllium and selenium detection limits are the same as the action limit. Reportable limits should be established with the laboratory to meet the data quality objectives.

Table 5: Comparison of ACLs to New Standards

	2008 – USACE, Louisville		
	Applicable Standards Basis	2008 KY Water Quality Standard (mg/L)	2008 Proposed ACL (Drought) (mg/L)
	Ohio River Flow (cfs)		11,000
Contaminant	Dilution Factor		1,100
Arsenic	WAH	0.01	11.0
Barium	DWS	2.000	2200
Beryllium	DWS	0.004	4.40
Cadmium ^b	WAH	0.0030	3.30
Chromium (VI)	OMS	0.011	12.1
Copper	OMS	0.012	13.2
Iron	WAH	1.00	1100
Lead (dissolved)	OMS	0.0036	3.96
Manganese	DWS	0.05	55
Mercury	WAH	0.00091	1.00
Selenium	DWS	0.005	5.5
Zinc	WAH	0.159	174.9
Benzene	CAG	0.0022	2.42

Changes for 2008, based only on the primary drinking water standards, and no change in dilution factors:

MCL has changed to 0.01mg/L for arsenic

Lead: value in 2003 - it is thought that this value did not appropriately convert to the dissolved value.

Chromium: value in 2003 - It is thought that this is inadvertently considered using the acute value rather than chronic, since other values were established using the chronic.

Beryllium: as of this report, the KY DWS for Beryllium is established at 0.004 mg/L.

Manganese: Kentucky 401 KAR 5:031 no longer specifies values (DWS, or WAH) for manganese in water. OMS has no requirement for manganese. The value is currently a national secondary drinking water standard

Selenium: National Primary drinking water standard is 0.05 (as used for the 2003 value; the KY WAH acute value is 0.02 and the chronic value is 0.005 mg/L)

Benzene: In 2003, changed from CAG to KY drinking water Standards; KY current drinking water standards are in the 2008 column.

WAH = Warm Water Aquatic Habitat

DWS = Drinking Water Supply (applicable at existing points of public water supply)

OMS = Ohio River Sanitation Commission developed Standards applicable specifically to the main stem of the Ohio River

CAG = Cancer Advisory Group, EPA HQ

The ROD generally references gas monitoring for the Site, in which six explosive (organic) gases have been identified in previous 5-year reviews for monitoring. These compounds are volatile organic gases, including benzene, toluene, xylene, methylene chloride, vinyl chloride, and methane.

As indicated in annual O&M reports, there is a notable increase in methane concentrations with time. The action limit for continuous monitoring is designated as 10% the LEL and 25% LEL is designated as an evacuation limit for workers at the Site, per the Operations and Maintenance Manual.

2. Landfill discharge regulations and Kentucky Water Quality Standards

EPA five-year review guidance requires a comparison of standards identified in the ROD, or as currently being enforced, against current standards. If a current standard is more stringent than the previous standard, the review process continues utilizing standards originally identified in the ROD as well as those current standards that are more stringent than those in effect at the signing of the ROD. There have been two federal actions pertaining to landfills.

a. On January 19, 2000 (65 FR 3008) EPA promulgated final effluent limitations guidelines (ELGs) for RCRA Subtitle C and RCRA Subtitle D landfills.

b. Updates to the 40 CFR 122.26 occurred in July 2003 for storm water discharges (applicable to State NPDES programs, see Section 123.25).

The federal actions do not affect the landfill or the protectiveness of the landfill gas collection system at present. However, when repairs on the landfill gas collection are made, the regulations will need to be reviewed for any updates that may apply to the landfill.

3. To Be Considered, (TBC)

Groundwater MCLG:

Maximum Contaminant Level Goals (MCLGs) - 40 CFR Part 141 lists National Primary Drinking Water Regulations. MCLGs are non-enforceable levels that fall into the ground water monitoring and corrective action provisions. With the MCL change above, a new MCLG at 0.0 mg/L was also set for arsenic drinking water standards. The arsenic regulations listed in §141.51 and §141.62 are effective for the purpose of compliance on January 23, 2006. Reporting limits provided by the laboratory (0.005 mg/L) have been sufficient to report on the revised MCL for arsenic during this review period. Values during this review period have been above the new limit, (0.1, 0.11, 0.12, and 0.11). (See Form C-3)

Air Quality:

The Louisville metropolitan statistical area (MSA) is inclusive of the Site. The MSA is designated as a nonattainment area for 8-hour ozone and particulate matter less than 2.5 μm ($\text{PM}_{2.5}$). A new standard for ozone was implemented in May 2008, where the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm for the MSA. Since ozone is a secondary pollutant formed by nitrogen oxides and organic gases in the presence of sunlight, organic emissions from the landfill are relevant to ozone concentrations in the Louisville MSA. 40 CFR 63 defines National Emission Standards for Hazardous Air Pollutants for Source Categories (a.k.a. Maximum Achievable Control Technology MACT)). There are 188, volatile organic compounds Hazardous Air Pollutants associated with this regulation. 401 KAR 63:190 for the State supports the national emission standards for organic hazardous air pollutants, and are neither more stringent nor otherwise different than the corresponding federal requirements. Additionally, 401 KAR 63:021 defines regulation for *existing sources* emitting toxic air pollutants, and is supported by maximum achievable control technology requirements for system modifications. Repairs to the gas ventilation system will be subject to MACT clauses for implementation.

4. ARAR Summary Statement

A review of standards identified as ARARs in the ROD was completed as well as an evaluation of new standards promulgated since the signing of the ROD. Three new federal regulations under the CWA have been promulgated since the 2003 review: Effluent Limitation Guidelines for Landfills (40 CFR 445, December 2004), General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403, July 2006). These new regulations are considered relevant and appropriate and should be further evaluated for incorporation into Site operations. Arsenic MCLs and MCLGs (40 CFR 141) implemented as new drinking water standards (effective January 23, 2006) are more stringent than the arsenic drinking water standards that were in effect at the time of the ROD in 1986. Additionally, the Commonwealth of Kentucky is a fully authorized CWA State,

and therefore any State adoption of these federal regulations would override the federal program. The state has promulgated surface water and ORSANCO regulations/requirements for the Ohio River since the 1986 ROD. Both of these regulations have been considered regarding whether the requirements that have been promulgated since the 1986 ROD affect the protectiveness of the ROD's selected remedy in previous reviews. Several of the requirements within these regulations have changed since the previous 5-year review. (See Table 4).

5. ARAR Compliance Recommendation

ACLs have been recalculated and proposed in Table 4 using drought condition flow of the Ohio River. All parties should evaluate potential protectiveness benefits of implementing the new ACLs for all criteria pollutants in groundwater with respect to the Ohio River. Future groundwater data should be compared to the proposed ACLs in table 4.

Risk Assessment Review

In addition to the ARARs Review, an evaluation of the Remedy Risk Assessment was conducted. The land is now used as an uncontrolled ATV riding location in which the public access the property freely. Additionally, Louisville has constructed a river walk that passes through the landfill property. Trespassers (on ATVs) and recreational walkers (on the river walk) are added as exposure paths in the Conceptual Site Model (CSM) for the Site.

Because of these findings, potential changes to toxicity values, exposure pathways, land use, and risk calculations pertinent to the Site were noted.

The arsenic drinking water MCL noted as an ARAR change above and some State surface water parameters are changes found affecting Question B in this review. The change is not expected to affect the effluent discharge at the Site, due to dilution by the Ohio River.

Data Review

Data from several reports included in Attachment C were reviewed and analyzed as follows:

Attachment C-2, the checklist for the Site inspection is prepared by MSD semi-annually. This latest report, dated December 19, 2007 indicated no distress to physical features such as ditches, rip-rap, and roads.

Attachment C-3 provides historical groundwater monitoring data relative to MCLs and ACLs. For the current review, new ACLs are proposed and have been calculated based on new Kentucky standards. Table 5 below summarizes the recent groundwater monitoring data relative to the updated ACLs. For groundwater monitoring wells 04 and 05, there have been no detections of COCs at this site above the new proposed ACLs.

Table 6: Groundwater Monitoring Data 2003 - 2007

Parameters Detected	Current Laboratory Detection Limits mg/L	Alternate Concentration Limit (mg/l) proposed 2008*	Sample Date			
			9/18/2003	9/22/2004	9/15/2005	12/4/2007
Well MW-04						
Beryllium	0.004	4.40	<0.004	<0.004	<0.004	<0.004
Chromium	0.01	12.1	<0.001	<0.001	<0.001	<0.001
Copper	0.01	13.2	<0.01	<0.01	<0.01	<0.01
Iron	0.02	1100	6	6.2	7.2	7.4
Manganese	0.01	55	0.14	0.14	0.15	0.15
Lead	0.005	3.96	0.0082	<0.005	<0.005	<0.005
Antimony	0.01	6.60	0.01	<0.01	<0.01	<0.01
Cadmium	0.005	3.30	<0.005	<0.005	<0.005	<0.005
Arsenic	0.005	11.0	0.01	0.011	0.012	0.011
1,2-Dichloroethane	0.01	5.50	<0.005	<0.005	<0.005	<0.005
Trichloroethane	0.005	5.50	<0.005	<0.005	<0.005	<0.005
Bis (2-ethylhexylphthalate	0.01	5.50	<0.001	<0.001	<0.001	<0.001
Hexavalent Chromium	0.01					<0.01
Well MW-05						
Beryllium	0.004	4.40	<0.004	<0.004	<0.004	<0.004
Chromium	0.01	12.1	<0.001	<0.001	<0.001	<0.001
Copper	0.01	13.2	<0.01	<0.01	<0.01	<0.01
Iron	0.02	1100	17	14	12	15
Manganese	0.01	55	0.86	0.7	0.54	0.68
Lead	0.005	3.96	<0.005	<0.005	<0.005	<0.005
Antimony	0.01	6.60	<0.01	<0.01	<0.01	<0.01
Cadmium	0.005	3.30	<0.005	<0.005	<0.005	<0.005
Arsenic	0.005	11.0	0.051	0.033	0.054	0.033
1,2-Dichloroethane	0.01	5.50	<0.005	<0.005	<0.005	<0.005
Trichloroethane	0.005	5.50	<0.005	<0.005	<0.005	<0.005
Bis (2-ethylhexylphthalate	0.01	5.50	<0.001	<0.001	<0.001	<0.001
Hexavalent Chromium	0.01					<0.01

* Based on 11,000cfs Ohio River flow
2006 – Laboratory lost samples, no data available

The Operations and Maintenance Manual indicates that the full Target Compound List will be used for reporting at the Site. Data associated with groundwater indicates that the method detection limit (0.01 mg/L) is not appropriate for reporting Antimony (MCL=0.006 mg/L) because the ACL is lower than the detection limit. Additionally, a method reportable limits should be established for the laboratory, where reporting at 3 times the detection limit should be required to reduce uncertainty in the measurement. This may be significant when evaluating cadmium or TCE, where reporting limits were 0.05 mg/L and the MCL is 0.005 mg/L. This 5-year review recommends reporting limits be established based on the action levels, or approved ACLs, data uncertainty and bias, and tolerable decision errors, where the established reportable limits must be 5 to 10 times the action levels (e.g. it is noted that cadmium was reported at ten times less prior to 2000. Data Quality Objectives should be reviewed and the Operations and Maintenance Manual should be updated to include the new DQOs prior to the next review.

Since all residents of the adjacent neighborhood are now connected to the municipal water supply, the 2003 Five-Year Review recommended dropping groundwater monitoring wells A, B, and 02. This five-year review tabulated the results of the samples taken from groundwater monitoring wells 04 and 05 (Table 5 and Form C-3). GW MWs-04 and 05 were kept in the monitoring program because they lie in the direction of groundwater flow towards the Ohio River. Monitoring these two wells will determine if any contamination from the landfill is flowing towards the Ohio River. For GW MWs-04 and 05, since 1995, there have been no detections of the contaminants of concern in the EDD, above the new, conservatively calculated and recommended ACLs. Because Kentucky Water Quality Standards required additional laboratory analyses for groundwater samples, the 2003 five-year review recommended groundwater sample analysis in this 5 year review period be modified to include beryllium, copper, hexavalent chromium (not total), and filtered lead (not total). In 2007 the new analyses were added to the analyses of groundwater from these two monitoring wells based on the 2003 five-year review recommendations. Laboratory reporting limits for cadmium(0.015 mg/L), copper (0.06 mg/L), and dissolved lead (0.015 mg/L), are at values too high to meet the State surface water criteria of 0.0030 mg/L, 0.012 mg/L, and 0.0036 mg/L respectively. Beryllium and selenium detection limits (0.004 mg/L and 0.005 mg/L) are the same as the action limit, and are therefore associated with some level of error. Using the reporting limits and detection limits that the laboratory has been using, there were no detections of beryllium, copper, hexavalent chromium or total chromium, or lead above the MCLs or the 2008 proposed ACLs. Reportable limits should be established with the laboratory to meet clearly documented data quality objectives.

Attachment C-4 provides tabulations of gas concentrations from the five gas monitoring wells (G-1, 2, 3, 4, and 5) in relation to the 25% LEL. A review of the data since 2001 shows that the level of methane has been increasing in monitoring well G-1. However, the levels of methane at all of the gas monitoring wells continue to be well below the 10% LEL. A plot of methane concentrations at these wells is provided as Attachment C-6. Because of the flash fires that occurred in the Riverside Gardens homes in the 1970s, efforts must continue to prevent vapor phase contaminants in the vadose zone from migrating towards the neighborhood. Gas monitoring wells G-1 and G-5 have levels of benzene, vinyl chloride, xylene, and toluene that fluctuate and sometimes have exceeded the screening values.

Attachment C-5 provides tabulations of gas concentrations from the six current ambient air monitoring stations (R1, R2, R3, U1, A1, and A2) in relation to the 25% LEL. All readings were well below the 25% LEL; however, the levels of methane have increased since 1997, similar to the rise of methane detected in one monitoring well over the same period. A plot of methane concentrations at the ambient air sampling locations is provided as Attachment C-7.

Attachment C-13 is the May 2004 letter report provided to the MSD, KEPPC, and EPA by SCS Engineers giving their evaluation of the LFG collection system. Mr. William Crawford, USACE Chemical Engineer, has reviewed the letter report and as built drawings and recommends that the LFG Collections System be repaired or replaced as soon as possible, (Attachment C-14). He recommends that the gas extraction wells, piping and moisture traps be immediately pumped to try to reestablish vacuum in the system. He also recommends that maintenance be performed in the blower house to correct the high pressure drop and reestablish higher vacuums in the North and South Headers. Mr. Crawford also suggests that the level of the water table be determined prior to any redesign of the gas collection wells, piping and condensate traps, in the event that the LFG Collection System must be replaced.

Site Inspection

Inspection of the Site was conducted on February 26, 2008 by representatives of the MSD, Smith Management Group, Inc., and the U.S. Army Corps of Engineers. The purpose of the inspection was to assess the protectiveness of the remedy, including the adequacy of site security measures. A complete list of inspection attendees is provided in Attachment C-1. Initially, the inspection team met off site at the main MSD maintenance facility, and the team was provided an overview of the remediation, monitoring, and O & M activities that have been done. Temperature on the day of the inspection was about 25° F and there were occasional snow flurries. Leaves and other vegetation had not developed and there was no snow accumulation. There was good visibility of the surface within wooded and brushy areas. Mr. Richard Watkins gave an overview of the Site's history and problems. The following items were noted and comments made during the inspections: Figures and photographs are included in Attachments A and B.

The access gate across the Lee's Lane entrance appears to be in good condition. It prevents motor vehicles from entering, but quad-runner ATVs can very easily go around the gate, around the blocked road at Putnam Lane or enter the landfill by traveling over the levee. See Photographs 8, 10, 11, and 12. At one visit to the neighborhood on March 21, 2008, the Lee's Lane gate was seen unlocked and standing open. Elmwood Avenue seems to be a popular place to gain access. See Photographs 25 and 26 and Figure 4. A truck did manage to access the area from some route and was found stuck in the mud, Photograph 9.

The levee itself appears to be in good condition. It was constructed on original materials landward of the landfill, and has relatively flat, well maintained slopes. There is an asphalt path on the levee South of Lee's Lane. Although motor vehicles cannot travel along the asphalt path, pedestrians and quad-runner ATVs can. The asphalt may deteriorate under heavy traffic. Pedestrians and ATVs can enter by using the Ohio River Walk. See Photographs 12 and 13.

The capped area appeared relatively flat with no major surface depressions observed, Photographs 4 and 5. There was some moderate to severe rutting across the cap due to uncontrolled trespasser quad-runner ATV traffic. See Photographs 6, 8, 11, and 14.

The access road to the South Tract has only a thin cover of gravel and is severely rutted, due mostly to the uncontrolled trespasser quad-runner ATV traffic. See Photograph 15 and Figure 2.

Although there appears to be much uncontrolled trespassing, the gas and groundwater monitoring wells, the gas collection wells, the gas collection blower house, and the settlement monuments do not appear to have been interfered with by trespassers. See Photographs 1, 2, 3, 10, 16, 17, 18, 20, 21, 22, 23, 24 and Figure 3.

Site security issues have historically been a major problem and are currently of concern. Uncontrolled trespasser ATV traffic significantly degrades site access, could destroy surface cover, and could be a significant liability issue. See Figure 4 and Photographs 11 – 14. Although, there is no known damage to the Site due to trespassers to date, there is a high potential for vandalism to site facilities such as the monitoring wells and monitoring equipment or for someone to be injured. The asphalt pathway, the Ohio River Walk, installed by the City of Louisville along the levee at the Site provides a new environmental exposure route and possible safety and liability issues. MSD, the City of Louisville, the KEPPC and the EPA need to evaluate the adequacy of current Site security and potential liabilities associated with the present situation of easy access to the Site.

Other major components of the remediation, such as the rip-rap erosion protection along the Ohio River bank, the clay cap over the landfill, and the on-going monitoring activities are satisfactory at this time.

Additional Review Meeting

Following the Site inspection, a request was made by Mr. Wesley Turner of KEPPC to hold a meeting to discuss the issues at the Lee's Lane Landfill. On March 17, 2008, a meeting was held at the MSD office conference room. A complete list of attendees is provided in attachment C-8. Concerns were expressed by KEPPC that gas monitoring well G-1 had increasing levels of methane. The well is about 600 feet away from the closest home. Because of flash fires that had occurred in 1975, Mr. Turner felt that the situation needs to be addressed as soon as possible. Mr. Turner stated that the Kentucky State Commissioner may soon be requesting the EPA to repair the LFG collection system. The EPA project manager has however reminded Mr. Turner that Kentucky has responsibility for Site oversight and financial obligations to effect repairs at the Site.

Interviews

Attempts were made to do in person interviews with residents who were mailed the flyers, but none of the residents were available. Twenty-five questionnaires (Attachment C-11) were left with postage-paid addressed envelopes for residents and invited comments on activities related to the Site. No responses to the questionnaires have been received at this time. Mr. Richard Watkins of MSD and Mr. Wesley Turner of KEPPC were interviewed by telephone by Karen Rabek of USACE for their comments on the Site's activities. Copies of the telephone interviews are found in Attachment C-12.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, groundwater and gas monitoring well data, and the results of the Site inspection indicate that the remedy has functioned as intended by the EDD until the last five-year review. The remedial actions have achieved the remedial objectives of preventing the migration of potentially explosive gases from the landfill to the Riverside Gardens subdivision, minimizing on-site exposure, minimizing off-site exposure, and providing some level of site security. The connection of all Riverside Gardens subdivision residents to municipal water has significantly reduced environmental risk from groundwater to the adjacent residents. However, increasing concentrations of methane gas in one of the five gas monitoring wells at the Site and the result of recent LFG system evaluation indicate a need for repairs to the system. Currently, the system is not functioning as efficiently as originally designed.

To prevent unauthorized access to the Site, the property is fenced and gated. However, a pedestrian path and quad-runner ATV traffic are currently present at the Site. Eventually, this situation could cause preventable damages to the landfill cap. Therefore, additional access control at the Site is warranted.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

An ARAR review was conducted for the Site in accordance with the EPA guidance document, "Comprehensive Five-Year Review Guidance," EPA 540-R-01-007, OSWER No. 9355.7-03B-P June 2001.

The arsenic drinking water MCL and other State surface water regulations for metals and benzene were noted as ARAR changes in this Five-Year review. Benzene has not been included in groundwater measurements during this review. The regulatory changes are not expected to impact the calculated health risk to humans at the Site, as the residents now use municipal water. However, the two groundwater wells used to monitor contaminant flow into the Ohio River remain relevant to the Site. The groundwater sampling data values should continue to be evaluated with respect to ACLs.

Because Kentucky Water Quality Standards required additional laboratory analyses for groundwater samples, the 2003 review recommended groundwater sample analysis in this Five-Year review period be modified to include beryllium, copper, hexavalent chromium (not total), and filtered lead (not total). According to the reported data for this review period, these parameters were added in 2007. Those parameters should continue to be monitored.

There is some concern about the potential migration of landfill gas into the nearby Riverside Gardens neighborhood. In the past, there had been explosive levels of methane and flash fires in some homes. Since its construction, the landfill gas collection system has prevented such conditions from reoccurring. By repairing the LFG equipment as needed in the near future, the system should continue to control methane from the Site effectively.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light to call the remedy protectiveness into question. As described above, current conditions of the landfill gas collection system indicates the need for repairs to the system. The repairs will ensure that the equipment continues to control the landfill gas and maintain the protectiveness of Site remedy.

Technical Assessment Summary

The remedial actions at this Site appear to have prevented the migration of explosive gas from the landfill to the Riverside Gardens subdivision as there have been no recent reports of methane gas leaking into the homes. Connection of all Riverside Gardens subdivision residents to municipal water has significantly reduced environmental risk to the adjacent residents. Methane monitoring at the Site remains well below action levels. However, increasing concentrations of the gas in one of the five gas monitoring wells and the current condition of the LFG system indicate a need for repairs to the system. Additionally, measures to limit pedestrian traffic adjacent to the landfill and uncontrolled ATV traffic at the Site are appropriate for the Site to protect the landfill cap.

VIII. Issues

Table 7: Issues

Issues	Affects Current Protectiveness (Y / N)	Affects Future Protectiveness (Y / N)
The deteriorating condition of the LFG collection system and minor increase in methane measurements from one of the five gas monitoring wells.	N	Y
Uncontrolled pedestrian and ATV traffic at the Site present possible damage to landfill cap.	N	Y
No local information repository	N	N
Unplugged groundwater monitoring wells A, B, and 02 no longer in sampling program	N	Y

IX. Recommendations and Follow-up Actions

The main recommendations of this Five-Year Review are to maintain the O&M activities programmed for the Site with increased KEPPC oversight and to proactively address the issues listed in the Table below.

Table 8: Recommendations and Follow-up Actions

Issues	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Increasing methane levels and LFG system condition	Repair and maintenance of the gas collection system	MSD	KEPPC	Dec 2009	N	Y
Trespassing by pedestrians and ATV traffic.	Re-evaluate and improve Site access restriction.	MSD, KEPPC	EPA	Dec 2009	N	Y
No information repository available to public.	Establish an information repository Locally	MSD	KEPPC,EPA	Dec 2008	N	N
Temporarily abandoned groundwater monitoring wells A, B, and 02 no longer in sampling program	Protect or plug and abandon the monitoring wells no longer being sampled	MSD	KEPPC	Dec 2009	N	Y

X. Protectiveness Statement

The remedy at the Lee's Lane Landfill Site currently is protective of human health and the environment. However, because of the blockage in the landfill gas collection system causing the system not to function properly, the level of methane in one gas monitoring well is rising. The system needs to function properly to prevent the migration of explosive gases from the landfill to the environment and minimize on-site and off-site risk of exposure to contamination or explosive hazards. In order for the remedy to be protective in the long-term, repairs of the subsurface gas collection system need to be made as soon as possible. Current pedestrian traffic adjacent to the landfill and the quad-runner ATV traffic at the Site should be curtailed to prevent damages to the landfill cap and potential human exposure to Site risks. In addition, restricting use of groundwater at the Site through institutional controls should ensure that the Site continues to be protective of human health and the environment.

XI. Next Review

The next Five-Year Review is due by September 2013, five years from the date of this review.

Attachment A Figures

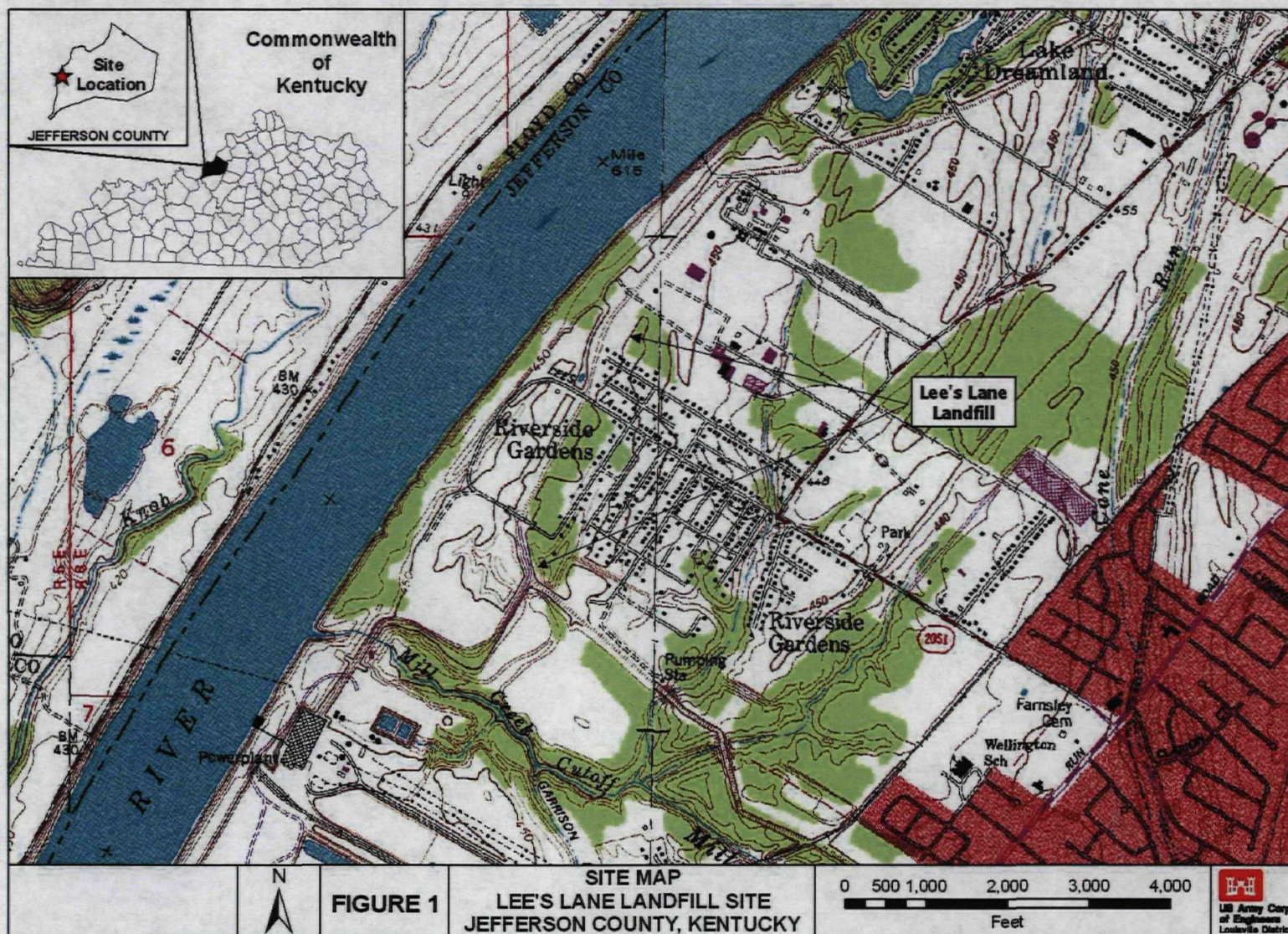
Figure 1	Site Map
Figure 2	Site Layout
Figure 3	Monitoring Locations
Figure 4	Site Inspection Map
Figure 5	Subsurface Gas Collection System
Figure 6	Cross-Section of Landfill
Figure 7	1998 Aerial Photograph of Site
Figure 8	1961 Topographic Map of Site
Figure 9(A-E)	Descriptions of Landfill Sections

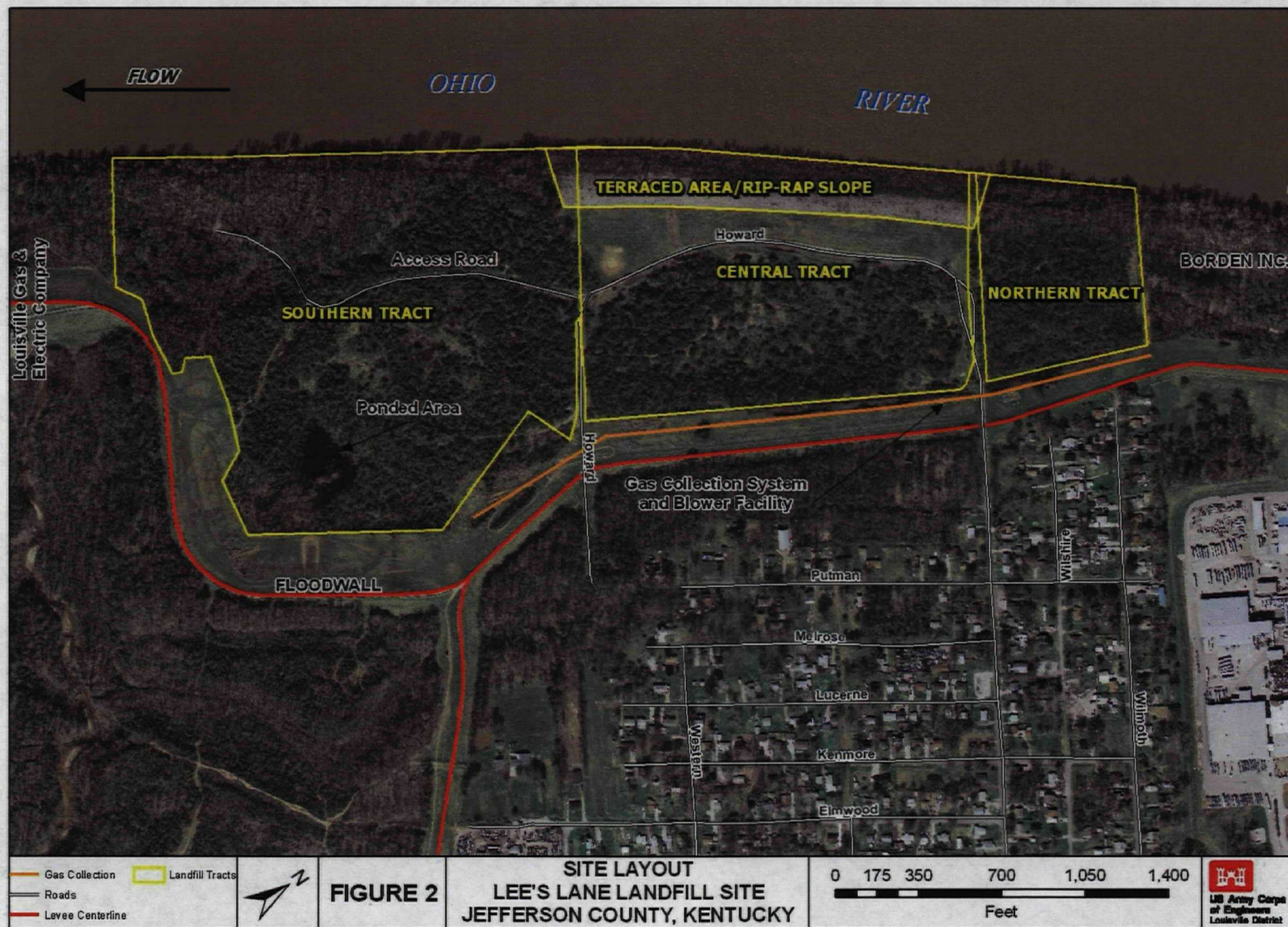
Attachment B Photographs

- Photograph 1 – Northern Boundary Fence looking from Lee's Lane access to northern tract
- Photograph 2 – Well G-4 by clump of trees
- Photograph 3 – Looking north at the blower house
- Photograph 4 – Looking South at landfill cap
- Photograph 5 – Landfill cap in central tract
- Photograph 6 – Groundwater Monitoring Well No. 1
- Photograph 7 – Orange markers and green pole, survey markers – show property is stable
- Photograph 8 – ATV tracks on landfill cap in central tract
- Photograph 9 – Truck stuck in the mud on the landfill cap in central tract
- Photograph 10 – Gas Well No. G-1 with ATV tracks around it
- Photograph 11 – ATV tracks on southern end
- Photograph 12 – Ohio River Walk through the landfill area
- Photograph 13 – Ohio River Walk looking south
- Photograph 14 – ATV tracks
- Photograph 15 – Putnam Lane access is closed beyond trees
- Photograph 16 – Gas Well No. G-2
- Photograph 17 – Gas Well No. G-3
- Photograph 18 – Blower house
- Photograph 19 – Putnam Lane blocked from access
- Photograph 20 – Gas Well No. G5 (in cage) – offsite sample location
- Photograph 21 – Gas Well No. G-4 – residential area
- Photograph 22 – offsite well removed from sampling after 2003 Five-Yr Review
- Photograph 23 - offsite well removed from sampling after 2003 Five-Yr Review
- Photograph 24 - offsite well removed from sampling after 2003 Five-Yr Review
- Photograph 25 – Elmwood Avenue, where ATV's access landfill from the junkyard parking lot
- Photograph 26 - Elmwood Avenue, where ATV's access landfill at the junkyard

Attachment C Forms

- 1 5-Year Review Site Inspection Attendees
- 2 5-Year Review Site Inspection Checklist (from MSD)
- 3 Groundwater Monitoring Data
- 4 Gas Monitoring Well Data
- 5 Ambient Air Monitoring
- 6 Plot of Methane Measurements in Gas Monitoring Wells
- 7 Plot of Methane Measurements in Ambient Air
- 8 5-Review Meeting Attendees
- 9 Newspaper Notification
- 10 Neighborhood Flyer
- 11 Questionnaires
- 12 Telephone Interviews
- 13 SCS Engineers Investigation Letter Report
- 14 USACE Comments on the SCS Letter Report
- 15 Administrative Order on Consent





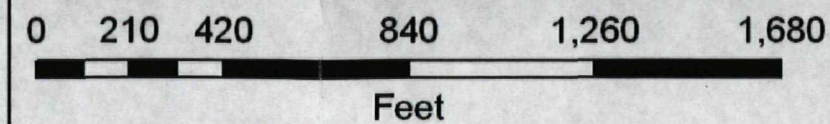


- ⊗ AMBIENT COLLECTION SITE
- GAS MONITORING WELL
- + GROUNDWATER MONITORING WELL



FIGURE 3

**MONITORING LOCATIONS
LEE'S LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY**

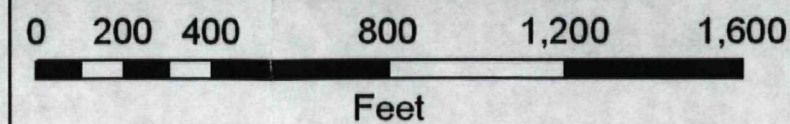


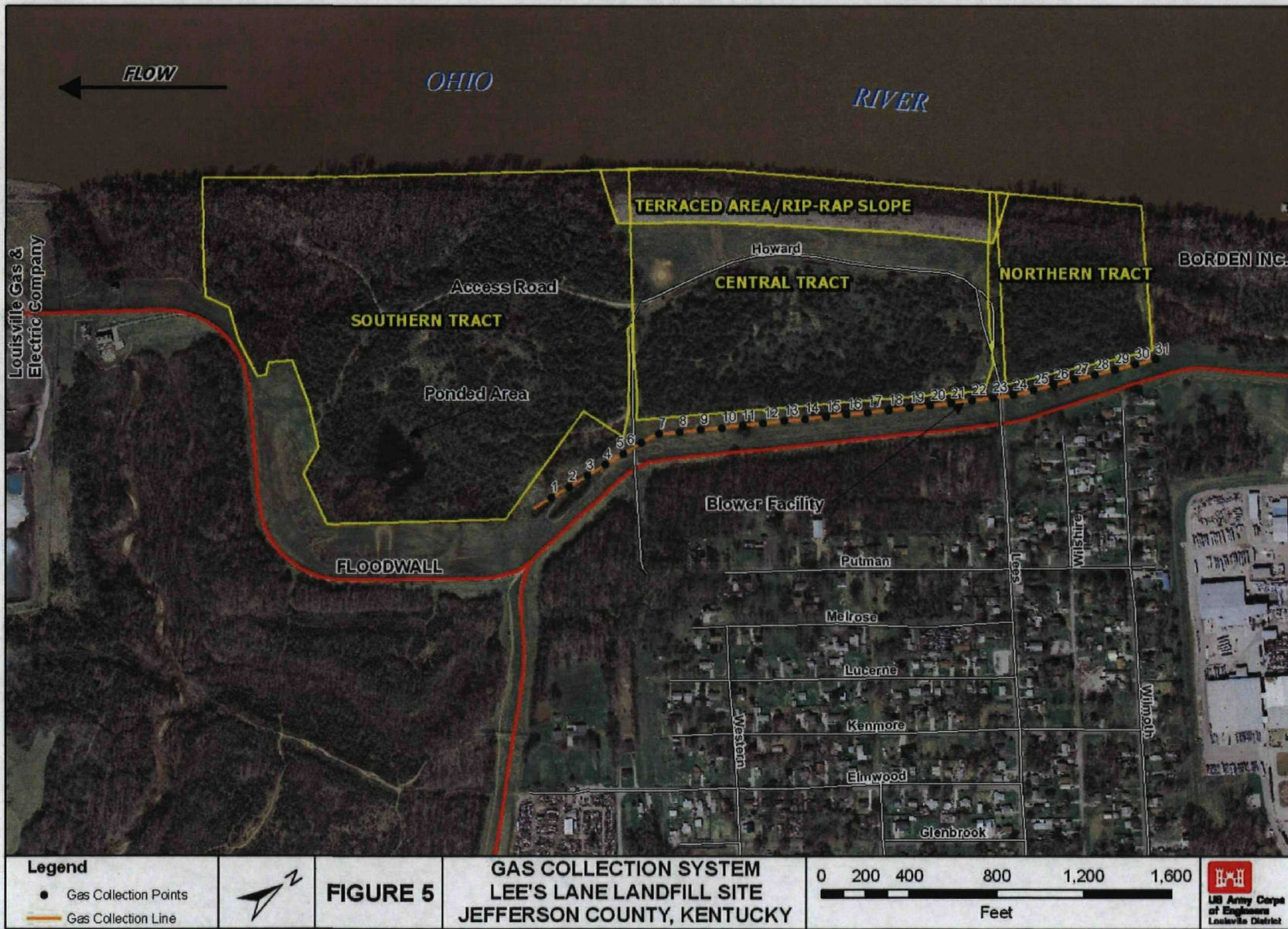


- | | |
|-----------------------------|---------------|
| AMBIENT AIR SAMPLE LOCATION | DRUM REBURIAL |
| GAS MONITORING WELL | ATV Access |
| GROUNDWATER MONITORING WELL | ATV Tracks |

FIGURE 4

**SITE INSPECTION MAP
LEE'S LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY**





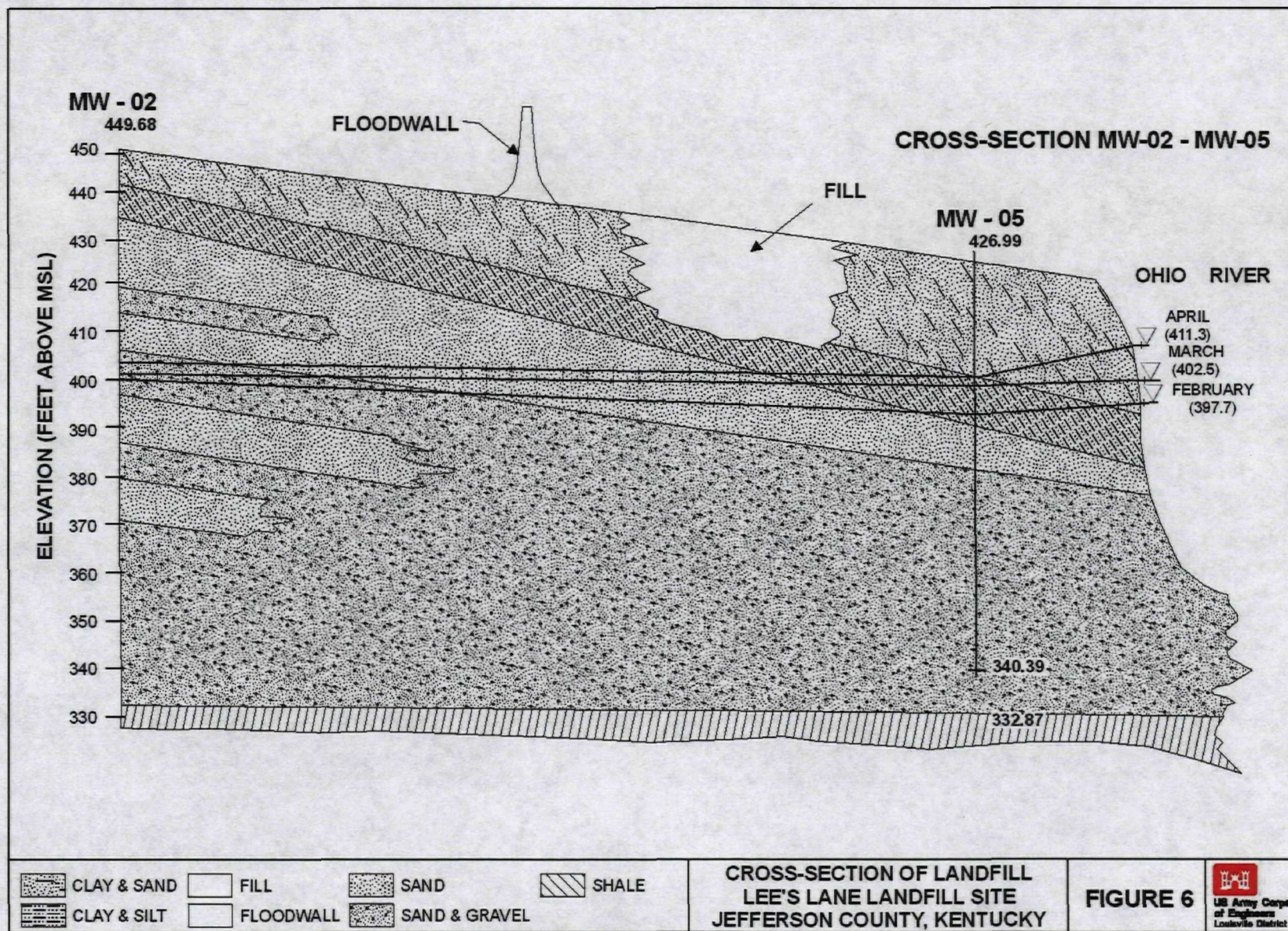


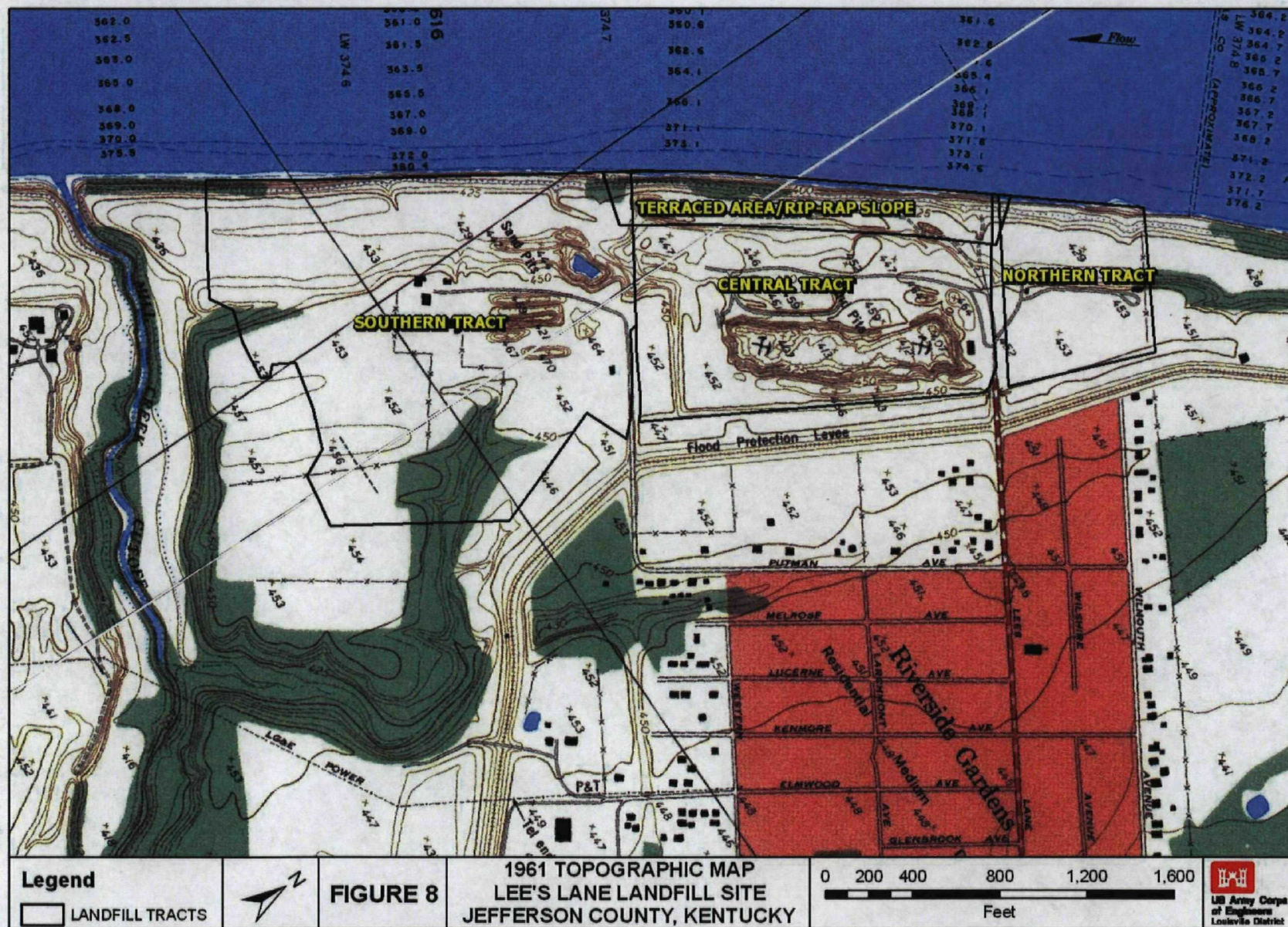


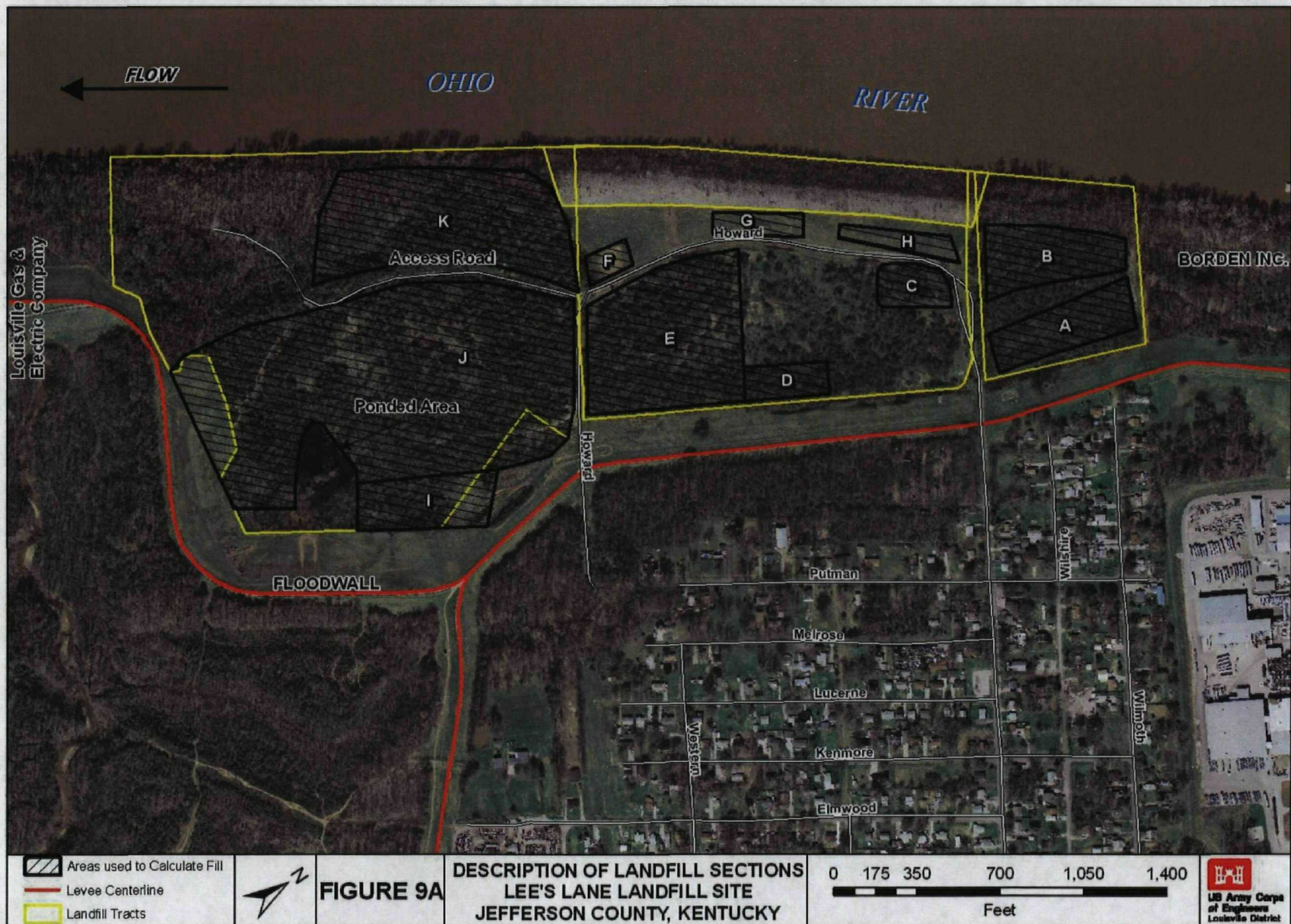
FIGURE 7

2005 AERIAL PHOTO
LEE'S LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY

0 200 400 800 1,200 1,600
Feet







**Area and Depth Values
Used To Calculate Waste Volume
Lees Lane Landfill Site
Jefferson County, Kentucky**

<u>Section</u>	<u>Estimated Surface Area (acres)</u>	<u>Estimated Waste Depth (feet)</u>	<u>Estimated Volume (cubic yards)</u>
<u>Northern Tract</u>			
A	3.2	40	206,000
B	6.2	23	250,000
<u>Central Tract</u>			
C	2.7	5	22,000
D	1.2	5	9,700
E	13.0	25	524,000
F	0.62	20	20,000
G	1.8	20	58,000
H	1.9	20	61,000
<u>Southern Tract</u>			
I	2.7	25	109,000
J	20.9	25	843,000
K	7.9	25	319,000

Notes: See Figures 3 – 9

**Figure 9B
Description of Landfill Sections
Lees Lane Landfill**

Northern Tract

The approximate volume of waste in the Northern Tract has been estimated at 2.65×10^5 cubic yards based on the assumptions presented below:

Section A

A large magnetic anomaly was delineated in the eastern portion of the Northern Tract. A well log from the installation of a Phase IV gas monitor well by SCS Engineers showed a refuse depth of approximately 40 feet.

Section B

Both the historical photographs and the magnetic surveys indicated possible disposal activity in this area. Based on the rapid slope of the land surface near the river as shown on the available topographic maps, the average depth of the fill material in the area was assumed equal to 23 feet.

Central Tract

The approximate volume of waste in the Central Tract has been estimated at 6.95×10^5 cubic yards based on the assumptions presented below:

Sections C, D

Most of the northern portion of the Central Tract between the levee and the access road was used as an auto junkyard. It is assumed that the activity in this area was limited to surface storage of junk. The surface scaring and staining liquids seen on several aerial photos was assumed to be due to the moving and storing of old automobiles. It is believed that excavation did not occur in this area. A minimal depth of 5 feet is assumed for these areas to allow for seepage of oils and grease into the soils.

Figure 9C
Description of Landfill Sections
Lees Lane Landfill

Section E

The southern portion of the Central Tract between the levee and the access road was used for disposal of waste. Since there is evidence of continuous traffic across this section, it is assumed that the excavated depth was relatively uniform. Gas monitor wells installed by SCS Engineers in 1979 indicated a refuse depth between 20 and 25 feet below the surface. 25 feet was the depth used to calculate the volume.

Sections F, G, H

Historical photographs indicate that the excavation and filling activity occurred in the several areas between the access road and the river. A monitor well installed in section F indicates a fill depth of 20 feet. It is assumed that the excavation and fill activity was limited to areas that did not extend beyond the river bank bluff. Therefore, a 20-foot fill depth was assumed for those areas.

Southern Tract

The approximate volume of wastes in the Southern Tract has been estimated at 1.27×10^6 cubic yards based on the assumptions presented below. Because of the size and topography of the two depressions in the Southern Tract, it is believed that wastes were not buried in either of these areas.

Section I

Historical photographs indicate continuous excavation and filling activity. The magnetometer survey showed high anomalous areas. An average depth of 25 feet was assumed based on physical features and topographic information.

Section J

From historical photographs this area was, apparently, where most of the mining operations occurred after 1950. Present topographic information and suspected slope of the pit during activity suggest an average depth of 25 feet within this section.

Figure 9D
Description of Landfill Sections
Lees Lane Landfill

Section K

Historical photographic interpretation shows excavation and fill activity were limited to areas off the river bank. Topographic information and physical features indicate a possible fill depth of 25 feet.

Waste Containment

Containment of leachate generated by the wastes can not be expected based on the available information concerning the geologic conditions and operation of the landfill site. There are no known liners or leachate collection systems currently in operation at the site. The natural materials in the alluvial aquifer beneath the landfilled area were estimated to have a permeability of 8.90×10^{-3} cm/sec based upon in-situ hydraulic conductivity tests conducted on MW-04. The soils above the aquifer are estimated to be an order of magnitude less permeable than the alluvial aquifer.

Observations recorded during the RI noted the apparent continued subsidence of the landfill as evidenced by relatively large depressions in the access road. These observations suggest that compaction may still be occurring at the site.

Since there are no available measurements on the permeability of the cover material at the landfill, the rate of percolation of rainwater and river water through the surface soils cannot be determined. Although the surface has not been graded to promote drainage, very little ponding was noted during the RI. Visual evidence suggests that the landfill cover does not appear to be capped with soils that would inhibit infiltration of surface waters.

Generally, the thicker the fill, the more concentrated the leachate will become.

Figure 9E
Description of Landfill Sections
Lees Lane Landfill

Attachment B

Photographs



Photograph 1 – Northern Boundary Fence looking from Lee's Lane access to Northern Tract



Photograph 2 – Well G-4 by clump of trees



Photograph 3 – Looking at the blower house from the access road off Lees Lane



Photograph 4 – Looking west across landfill cap towards the Ohio River



Photograph 5 – Landfill cap in central tract looking west towards the Ohio River



Photograph 6 – Groundwater Monitoring Well No. 1



Photograph 7 – Orange markers and green pole, survey markers – show property is stable



Photograph 8 – ATV tracks on landfill cap in Central Tract



Photograph 9 – Truck stuck in the mud on the landfill cap in Southern Tract



Photograph 10 – Gas Well No. G-1 with ATV tracks around it



Photograph 11 – ATV tracks on Southern Tract



Photograph 12 – Ohio River Walk through the landfill area



Photograph 13 – Ohio River Walk looking south



Photograph 14— ATV tracks



Photograph 15 – Putnam Lane access is closed beyond trees



Photograph 16 – Gas Well No. G-2



Photograph 17 – Gas Well No. G-3



Photograph 18 – Blower house



Photograph 19 – Putnam Lane blocked from access



Photograph 20 – Gas Well No. G-5 (in cage) – offsite sample location



Photograph 21 – Gas Well No. G-4 – residential area



Photograph 22 – offsite well removed from sampling after 2003 Five-Yr Review.



Photograph 23 - offsite well removed from sampling after 2003 Five-Yr Review.



Photograph 24 - offsite well removed from sampling after 2003 Five-Yr Review.



Photograph 25 – Elmwood Avenue, where ATV's access landfill form the junkyard parking lot



Photograph 26 - Elmwood Avenue, where ATV's access landfill at the junkyard

Attachment C

Forms

LEE'S LANE LANDFILL
Jefferson County
Louisville, Kentucky
4th Five-Year Review Site Visit

26 February 2008

Name	Agency	Phone Number	e-Mail
Karen Rabek	COE	(502) 315-6328	karen.v.rabek@usarmy.mil
Nat Peters	COE	(502) 315-6333	nat.peters@us.army.mil
RICHARD WATKINS	MSD	(502) 425-7969	WATKINSR@MSDLW.KY
Scott Smith	Smb	859-231-8936 x116	SCOTTR.Smith@smithmanning.com

Form C-1
5-YR Review Site Visit
Inspection Attendees

REPORT OF FIELD OBSERVATION
LEE'S LANE LANDFILL SITE, LOUISVILLE, KENTUCKY

Observation Report No: FY08-2Q Date of Observation 12/19/07

Time Arrived Onsite: 10:45 AM Time Departed Site: 12:22 PM

Field Personnel: RICHARD H WATKINS, SR. INFRASTRUCTURE LIAISON

Section A: General Site Conditions

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	Comment <u>No.</u>
1. Major settlement of topsoil or erosion exposing waste/fill material	—	—	—	—
2. Evidence of leachate seepage	—	—	—	—
3. Distressed Vegetation	—	—	—	—
4. Pot holes, erosion of access road	<u>X</u>	—	—	<u>A-4</u>

Section B: Institutional Controls

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	Comment <u>No.</u>
1. Structural problem with Lee's Lane gate or barricade	—	<u>X</u>	—	<u>B-1</u>
2. Structural problem with Putman Ave. barricade	—	<u>X</u>	—	<u>B-2</u>
3. Lee's Lane gate unlocked	—	—	—	—
4. Broken or missing lock	—	—	—	—

Section C: Gas Collection System

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	Comment <u>No.</u>
1. Vandalism to blower house wells, or moisture traps	—	—	—	—
2. Structural damage to blower house	—	—	—	—
3. Blower not operating or visible damage	—	—	—	—
4. Blower house not secure and unclean	—	—	—	—

Form C-2
Site Inspection Checklist

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	Comment <u>No.</u>
---------------	-------------	-----------	-------------------------	-----------------------

5.	Service box lids not in place	—	—	—	—
6.	Alarm and blower controls not functioning	—	—	—	—
7.	Settlement or tilting of well/moisture trap concrete collars	<u>X</u>	—	—	<u>C-7</u>
8.	Well/moisture trap covers missing or damaged	<u>X</u>	—	—	<u>C-8</u>
9.	Excessive vegetation covering wells/moisture traps	—	—	—	—
10.	Adjustment valve inaccessible	—	—	—	—
11.	Well/moisture trap caps, plugs, and piping missing	—	—	—	—
12.	Blower house and well/moisture trap signs missing or damaged	—	—	—	—

Section D: Groundwater & Gas Monitor Wells

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	<u>Comment No.</u>
1. Wells unlocked	—	—	—	—
2. Guard posts and rails missing or damaged	—	—	—	—
3. Protective casing missing, damaged or rusted	<u>X</u>	—	—	<u>D-3</u>
4. Concrete pads damaged or cracked	—	—	—	—
5. Possible surface water infiltration into wells	—	—	—	—
6. Excessive vegetation or debris around wells	—	—	—	—
7. Well cap missing or damaged	—	—	—	—
8. Tubing, fittings, and valves missing or damaged (gas wells only)	—	—	<u>X</u>	<u>D-8</u>

Section E: Bank Protection Controls

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	<u>Comment No.</u>
1. Subsidence of slope, sloughing or caving	—	—	—	—
2. Erosion of rip-rap or underlying material	—	—	—	—
3. Abnormally damp areas, wet ground vegetation	—	—	—	—
4. Soft spots in surface	—	—	—	—
5. Seepage, water flow, piping, or sand boils	—	—	—	—
6. Undermining of rip-rap	—	—	—	—
7. Vegetative growth on rip-rap slope	<u>X</u>	—	—	<u>E-7</u>
8. Buildup of trash and debris on rip-rap	—	<u>X</u>	—	<u>E-8</u>
9. Exposed trash or filter fabric	—	—	—	—
10. Tilting trees	—	—	—	—
11. Tension cracks	—	—	—	—
12. Survey monuments missing or damaged	—	—	—	—

Section F: Surface Waste Cleanup/Cover

Observations:	<u>Yes*</u>	<u>No</u>	<u>Not Observed</u>	<u>Comment No.</u>
1. Swales greater than 1 foot wide and 2 inches deep	—	—	—	—
2. Cracks greater than 1 inch wide and 6 inches deep	—	—	—	—
3. Areas of erosional damage to grass	<u>X</u>	—	—	<u>F-3</u>
4. Inadequate grass cover (area > 36 ft ²)	<u>X</u>	—	—	<u>F-4</u>
5. Ponded water (area larger than 2 feet in diameter and 3 inches deep)	<u>X</u>	—	—	<u>F-5</u>
6. Erosion or ponded water greater than 12 inches deep (requires immediate repair)	—	—	—	—

*If yes, assign a comment no. in the last column and follow instructions on comment sheet.

REPORT OF FIELD OBSERVATION
LEE'S LANE LANDFILL SITE, LOUISVILLE, KENTUCKY

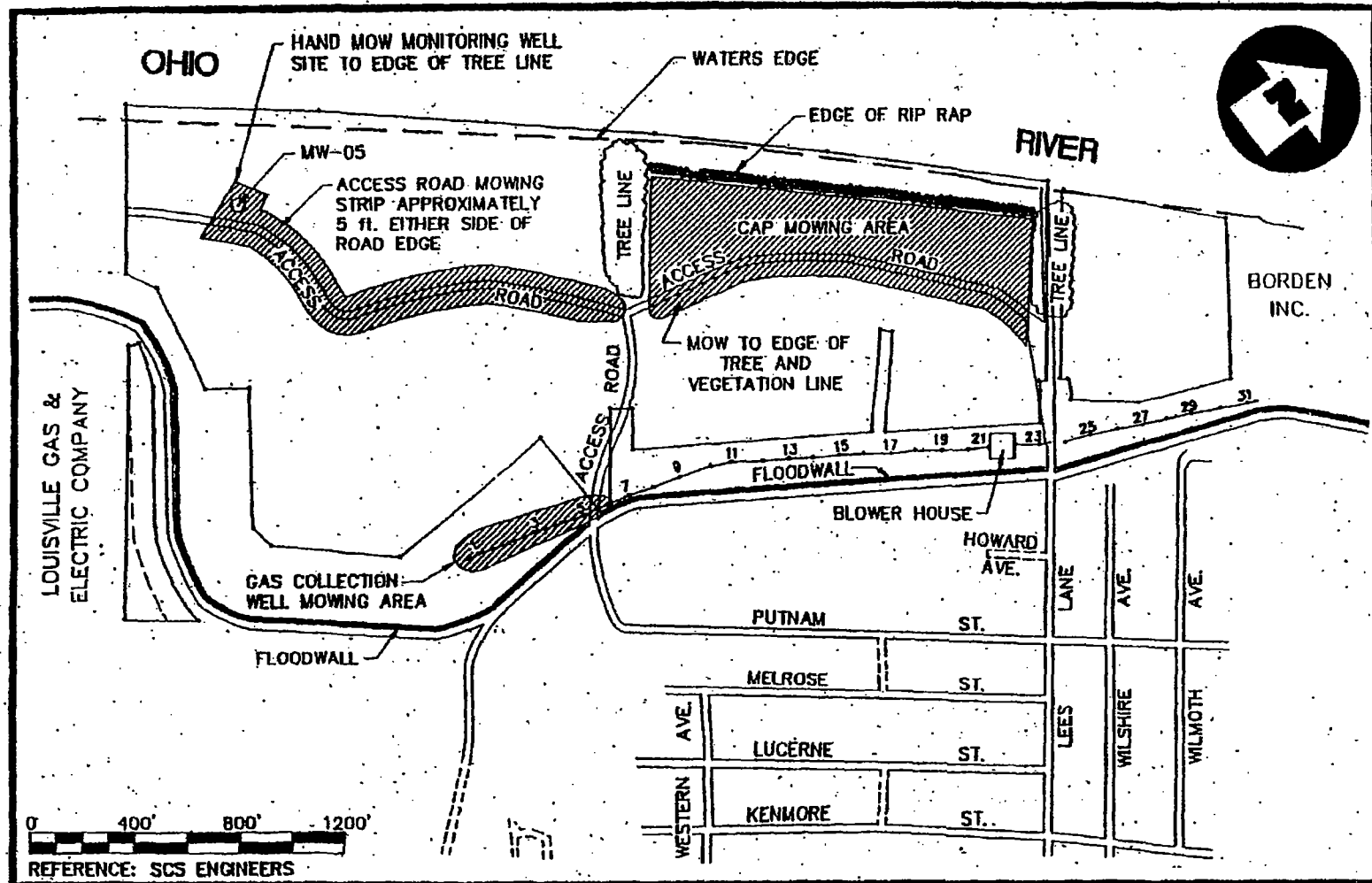
Observation Report No: FY08-2Q

Date of Observation 12/19/07

Site Map

Observer's Signature: _____

Date: _____



**GAS COLLECTION SYSTEM
LEES LANE LANDFILL SITE
JEFFERSON COUNTY, KENTUCKY**

EXHIBIT NO. 1

**REPORT OF FIELD OBSERVATION
LEE'S LANE LANDFILL SITE, LOUISVILLE, KENTUCKY**

Observation Report No.: FY08 - 2Q

Date of Observation: 12/19/07

Instruction: If any item is checked yes, provide details of the problem and maintenance recommendations below and indicate the location of deficiency on the site map provided.

Comment No.:

Comment

- | | |
|-----|--|
| A-4 | Small amount of rutting was observed on the gravel road leading to gas collection Well No. 5 from ATVs. |
| B-1 | Condition of the Lee's Lane barricade remains unchanged from previous quarterly institutional inspections. |
| B-2 | Condition of the Putnam Avenue barricade remains unchanged from previous quarterly institutional inspections. Intrusions into the landfill site and flood protection levee areas by ATVs from the woods adjacent to the Putnam Avenue barricade has been reduced, but is still evident. The landfill site and flood protection levee continues to receive surveillance by the Jefferson County Police. |

Comment No.

Corrective Action Performed

- | | |
|-----|--|
| A-4 | Schedule gravelling of the access road leading to Well No. 5 to fill rutted areas during FY08 - 3Q as weather and scheduling permit. |
| B-1 | Continue to observe condition of the Lee's Lane barricade during future quarterly institutional inspections. Schedule painting of Lee's Lane barricade during FY08 - 3Q. |

B-2

Continue to observe condition of the Putnam Avenue barricade during future quarterly institutional inspections. Replace damaged "No Trespass - Keep Out" signs at strategic locations along the access roads and Mill Creek cut-off channel areas in an effort to discourage ATV intrusions and trespass into the landfill and levee area sites. Schedule painting of Putnam barricade by end of FY08- 3Q.

Comment No.:

Comment

- | | |
|-----|---|
| C-7 | Observed tilted well and moisture trap concrete collars for 2, 4, 8, 11, 12, 14, and 16 |
| C-8 | Observed covers missing for moisture traps 25, 26, and 27. |
| D-3 | Observed protective casing of gas monitoring wells rusting. |

Comment No.

Corrective Action Performed

- | | |
|-----|---|
| C-7 | Schedule resetting of tilted well and moisture trap concrete collars for moisture traps 2, 4, 8, 11, 12, 14 and 16 weather and scheduling permitting. |
| C-8 | Obtain replacement covers and install on moisture traps |
| D-3 | Schedule painting of gas monitoring wells protective casings during FY08 - 3Q. |

Comment No.:**Comment**

- D-8 Monitoring wells tubing, fittings, and valves were not directly observed but no external damage or disturbance to enclosures was evident.
- E-7 Observed vegetative growth on portions of the riprap levee and riprap drainage channel slopes.
- E-8 Observed small amount of trash and debris build-up on the riprap area from prior observations. Trespassers continue to utilize the debris as fuel for small bonfires, thereby eliminating the necessity to remove the debris from the riprap area. Also observed automobile hood that has been dumped in scale.
- F-3 Observed areas of erosional damage to grass caused by off road vehicles
- F-4 Observed areas of inadequate grass cover from intrusion of ATVs.
- F-5 Observed area of ponding water from intrusion of off road vehicles creating several ruts and low areas.

Comment No.**Corrective Action Performed**

- D-8 Monitoring well tubing, fittings, and valves were not directly observed but no external damage or disturbance to enclosures was evident.
- E-7 Spraying of the riprap drainage channels and riprap cap area should be scheduled during FY08 - 3Q.
- E-8 Schedule removal of large debris and automobile hood and monitor for additional debris.
- F-3 Monitor and schedule restoration of eroded areas as required as weather and staffing permit.
- F-4 Monitored at future quarterly institutional inspections backfill and seed areas as necessary.
- F-5 Condition of ruts left by ATVs and other vehicles should be monitored at future quarterly institutional inspections and scheduled backfilling as necessary.

Form C-3 Groundwater Monitoring Data

GW MW-A

Parameter Detected	Maximum Contaminant Level (mg/L)	Sample Date								Sample Date								Sample Date				
		07/88	10/88	03/89	06/89	10/92	02/93	05/93	08/93	11/93	06/94	09/94	11/94	03/95	09/95	12/95	05/96	12/96	11/99	09/00	09/01	09/02
Units:		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Chromium	0.1	0.029	ND	0.013	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	0.032	0.064
Iron	0.3 ^{SMCL}	51	1.3 J	3	0.31	3.9	0.45	0.5	0.42	0.7	0.49	0.52	0.57	0.66	1.3	0.44	0.57	0.52	0.32	0.066	1.4	0.66
Manganese	0.05 ^{SMCL}	4.1	0.12	0.27	0.071	0.38	0.052	ND	ND	0.075	ND	ND	0.032	ND	0.059	ND	ND	ND	0.026	< 0.01	0.089	0.025
Lead	0.015	0.045	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.005	< 0.05	< 0.05	< 0.05
Antimony	0.006	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.03	< 0.01	< 0.01	< 0.01
Cadmium	0.005	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	< 0.05	< 0.05	< 0.05
Arsenic	0.05	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichloroethane	0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethane	0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	0.006	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05
																			< 0.01	< 0.01	< 0.01	< 0.01

SMCL = Secondary Maximum Contaminant Level

NA = Not Analyzed

ND = Compound Not Detected

GW MW-B

Parameter Detected		Maximum Contaminant Level (mg/L)	Sample Date												Sample Date											
		Units:	07/88 (mg/L)	10/88 (mg/L)	03/89 (mg/L)	06/89 (mg/L)	10/92 (mg/L)	02/93 (mg/L)	05/93 (mg/L)	08/93 (mg/L)	11/93 (mg/L)	03/94 (mg/L)	06/94 (mg/L)	09/94 (mg/L)	11/94 (mg/L)	03/95 (mg/L)	06/95 (mg/L)	09/95 (mg/L)	12/95 (mg/L)	05/96 (mg/L)	03/96 (mg/L)	12/96 (mg/L)	09/00 (mg/L)	09/01 (mg/L)	09/02 (mg/L)	
Chromium		0.1	0.023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	0.014	0.21	
Iron		0.3 ^{SMCL}	10	0.5 J	0.9	0.3	3.9	0.55	0.6	0.34	0.6	4.5	1	1	0.54	0.61	1.4	0.7	0.35	0.94	0.39	0.4	0.23	2.2	3.9	
Manganese		0.05 ^{SMCL}	1	0.3	0.63	0.22	0.38	0.48	ND	0.37	0.41	1.2	0.52	0.45	0.31	0.3	0.5	0.36	0.27	0.16	0.18	0.21	0.3	0.25	0.33	
Lead		0.015	0.018	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.038	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Antimony		0.006	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	
Cadmium		0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Arsenic		0.05	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
1,2-Dichloroethane		0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Trichloroethane		0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Bis(2-ethylhexyl)phthalate		0.006	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	

SMCL = Secondary Maximum Contaminant Level

NA = Not Analyzed

ND = Compound Not Detected

GW MW-02

Parameter Detected	Maximum Contaminant Level (mg/L)	Sample Date								Sample Date								Sample Date						
		07/88	10/88	03/89	06/89	10/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	12/95	05/96	03/96	12/96	09/00	09/01	09/02	
	Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	
Chromium	0.1	ND	0.089 J	0.026	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.02	< 0.03	
Iron	0.3 ^{SMCL}	0.95	1.1 J	2.3	0.32	2.8	3	2.9	3	2.8	3.2	2.9	3.1	3.4	3.5	3	2.8	3.6	3.5	4.2	4.1	4.3	4.8	
Manganese	0.05 ^{SMCL}	0.15	0.067	0.16	0.11	0.11	0.12	0.11	0.13	0.11	0.1	0.12	0.11	0.13	0.13	0.11	0.12	0.13	0.15	ND	0.19	0.19	0.21	
Lead	0.015	0.015	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.015	ND	ND	ND	< 0.05	< 0.05	< 0.05
Antimony	0.006	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	
Cadmium	0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Arsenic	0.05	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
1,2-Dichloroethane	0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Trichloroethane	0.005	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	
Bis(2-ethylhexyl)phthalate	0.006	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	

SMCL = Secondary Maximum Contaminant Level

NA = Not Analyzed

ND = Compound Not Detected

GW MW-04

Parameter Detected	Alternate Concentration Limit (mg/L) revised 2003*	Sample Date								Sample Date								Sample Date								Sample Date			
		07/88	10/88	03/89	06/89	10/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	05/96	03/96	12/96	09/00	09/01	09/02	9/18/2003	9/22/2004	9/15/2005	12/4/2007	
		Units: (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	
Chromium		55	0.009	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Iron		1100	0.61	3.7 J	9.3	8.7	5.9	7.2	6.3	6	5.8	7	6.4	6.5	6.2	6.3	5.9	6	5.7	7.2	8.6	6.3	5.5	6.2	6.4	6	6.2	7.2	7.4
Manganese		55	ND	0.15	0.33	0.27	0.16	0.17	ND	0.16	0.15	0.16	0.16	0.15	0.16	0.15	0.14	0.15	0.13	0.16	0.2	0.16	0.14	0.14	0.15	0.14	0.14	0.15	0.15
Lead		55	0.029	0.023	ND	0.007	ND	0.028	ND	ND	ND	0.12	ND	0.035	0.021	ND	ND	0.016	ND	0.019	0.039	ND	0.0068	0.0068	< 0.05	0.0082	< 0.005	< 0.005	< 0.005
Antimony	(0.006)	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	
Cadmium	13.2	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005	
Arsenic	55	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.012	0.11	0.0061	0.01	0.011	0.012	0.011	
1,2-Dichloroethane	(0.005)	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.005	< 0.005	< 0.005	< 0.001	
Trichloroethane	(0.005)	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.005	< 0.005	< 0.005	< 0.001	
Bis(2-ethylhexyl)phthalate	(0.006)	ND	ND	ND	ND	0.056	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

NA = Not Analyzed

ND = Compound Not Detected

{ } = Maximum Contaminant Level (MCL)

*Based on 11,000 cfs Ohio River flow

GW MW-05

Parameter Detected	Alternate Concentration Limit (mg/L) revised 2003*	Sample Date								Sample Date								Sample Date								Sample Date			
		07/88	10/88	03/89	06/89	10/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	05/96	03/96	12/96	09/00	09/01	09/02	9/18/2003	9/22/2004	9/15/2005	12/4/2007	
		Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Chromium	55	NA	0.83 J	0.008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	0.026	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Iron	1100	NA	17 J	7.7	12	110	41	130	ND	55	21	110	140	120	14	110	70	240	48	46	17	14	ND	26	17	14	12	15	
Manganese	55	NA	2.3	1.4	0.75	0.98	0.72	1.1	ND	0.82	0.58	1.1	1	1.2	1.1	1.2	0.97	1.3	0.78	0.71	ND	0.9	ND	0.92	0.86	0.7	0.54	0.68	
Lead	55	NA	ND	25	3.7	1.3	0.43	0.72	0.99	0.39	0.09	0.62	0.24	0.3	0.06	0.21	0.23	0.32	0.06	0.52	0.14	< 0.05	< 0.05	0.088	< 0.005	< 0.005	< 0.005	< 0.005	
Antimony	(0.009)	NA	ND	0.58	0.082	0.036	ND	ND	ND	0.043	ND	ND	0.042	0.043	ND	ND	ND	ND	ND	ND	ND	< 0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Cadmium	13.2	NA	NA	NA	NA	0.0092	0.0053	ND	ND	ND	ND	ND	0.0053	0.005	ND	ND	0.0054	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.005	< 0.005	< 0.005	< 0.005	
Arsenic	55	NA	ND	0.017 J	0.01 J	0.8	0.3	ND	2.6	0.36	0.12	0.38	0.72	0.85	ND	0.55	0.53	1.6	0.3	0.26	0.07	0.029	< 0.05	0.1	0.051	0.033	0.054	0.033	
1,2-Dichloroethane	(0.005)	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.005	< 0.005	< 0.005	< 0.001	
Trichloroethane	(0.005)	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.05	< 0.05	< 0.05	< 0.005	< 0.005	< 0.005	< 0.001	
Bis(2-ethylhexyl)phthalate	(0.006)	ND	ND	ND	0.046	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

Form C-4 Gas Monitoring Well Data

G-1:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date								Sample Date								Sample Date								
			07/88	11/88	03/89	07/89	11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	04/98	09/99	04/01
			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Units:																											
Benzene	0.325	3,250,000					0.26	0.24	0.85	0.5	0.26	0.5	0.5	1.03	0.17	0.21	0.21	1.66	0.5	0.06	0.15	0.06	0.85	VOID	6.95	23.7	0.66
Toluene	0.3	3,000,000					0.47	0.14	0.85	0.5	2.3	0.52	5.73	3.71	0.21	0.58	1.72	10.25	2.22	0.2	0.47	0.25	4.82	VOID	10.2	154	4.36
Xylene (total)	0.275	2,750,000					0.45	0.13	0.85	0.5	0.75	0.5	1.61	1.43	0.16	0.36	0.76	6.2	1.2	0.06	0.76	0.07	3.45	VOID	1.11	3.09	0.527
Methylene Chloride	3.5	35,000,000					ND	0.68	0.85	0.5	0.3	0.5	0.5	0.11	0.07	0.25	0.54	0.49	0.01	0.01	0.1	0.01	4.02	VOID	2.77	0.58	9.97
Vinyl Chloride	0.9	9,000,000					ND	ND	0.85	0.5	0.3	0.5	0.5	0.5	0.5	0.01	0.01	0.01	0.01	0.01	0.01	ND	1.19	VOID	6.69	11.8	ND
Methane	1.25	12,500,000	4.2	2,760	**	ND	ND	4.8	2.08	1.7	2.13	3.52	1,052	3.11	3.28	2.82	2.85	2.72	4.05	51.84	ND	1.8	1,580,000	VOID	2,130,000	11,700	14,900

ND = Not Detected

** = Invalid

G-2:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date								Sample Date								Sample Date								
			07/88	11/88	03/89	07/89	11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	04/98	09/99	04/01
			Units:			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000					0.19	0.05	0.8	0.5	0.11	0.5	0.5	0.15	0.21	0.09	0.13	0.08	0.09	0.05	0.12	0.13	0.38	VOID	0.24	0.06	0.044
Toluene	0.3	3,000,000					0.26	0.03	1	0.5	0.23	0.5	1.06	0.89	0.24	0.34	0.58	0.53	0.32	0.19	0.43	0.55	1.68	VOID	0.48	0.22	0.461
Xylene (total)	0.275	2,750,000					0.28	0.06	0.8	0.5	0.2	0.5	0.5	0.26	0.22	0.17	0.45	0.28	0.19	0.01	0.39	0.13	2.51	VOID	0.19	0.14	0.07
Methylene Chloride	3.5	35,000,000					ND	0.29	0.8	0.5	0.3	0.5	0.5	0.5	0.06	1.99	0.05	0.01	0.01	0.01	0.88	0.06	1.47	VOID	0.36	0.12	0.115
Vinyl Chloride	0.9	9,000,000					ND	ND	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.01	0.01	0.01	0.01	0.01	0.01	ND	12.8	VOID	0.04	0.25	ND
Methane	1.25	12,500,000	1.8	121,000	**	ND	ND	3.6	2.06	0.05	0.75	3.07	0.89	3.63	3.46	1.11	2.94	0.9	1.73	2.62	5.56	0.87	4,980	VOID	1,200,000	16,200	11,900

ND = Not Detected

** = Invalid

G-3:

	25% LEL	25% LEL	Sample Date								Sample Date								Sample Date								
Compound	(%)	(ppbv)	07/88	11/88	03/89	07/89	11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	04/98	09/99	04/01
Units:			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000					0.19	0.26	0.75	0.5	0.12	0.5	0.5	0.15	0.06	0.15	0.1	0.51	0.1	0.07	0.09	0.12	0.17	0.62	0.92	0.24	0.266
Toluene	0.3	3,000,000					0.29	0.16	0.75	0.5	0.27	0.5	0.5	0.91	0.09	0.24	0.42	4.27	0.36	0.34	0.34	0.33	0.68	4.91	1.89	0.72	1.88
Xylene (total)	0.275	2,750,000					0.26	0.11	0.75	0.5	0.2	0.5	0.5	0.29	0.11	0.23	0.31	1.25	0.21	0.08	0.23	0.13	0.46	1.45	1.52	0.08	0.291
Methylene Chloride	3.5	35,000,000					ND	0.32	0.75	0.5	0.3	0.5	0.5	0.5	0.02	0.83	0.05	0.19	0.01	0.01	0.46	0.05	0.76	0.41	4.73	0.18	0.162
Vinyl Chloride	0.9	9,000,000					ND	ND	0.75	0.5	0.5	0.5	0.5	0.5	0.5	0.01	0.01	0.01	0.01	0.01	0.01	ND	0.01	0.22	ND	ND	ND
Methane	1.25	12,500,000	9.4	2,820	**	ND	ND	4.3	0.84	1.4	0.88	2.1	0.86	3.73	2.36	2.49	2.9	3.88	2.37	1.94	4.24	0.89	5,030	2,670	1,230	17,200	17,900

ND = Not Detected

** = Invalid

G-4:

	25% LEL	25% LEL	Sample Date								Sample Date								Sample Date								
Compound	(%)	(ppbv)	07/88	11/88	03/89	07/89	11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	04/98	09/99	04/01
			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Units:																											
Benzene	0.325	3,250,000					0	0	1	1	0	1	0.63	0.61	0.91	0.18	NA	0.51	0.66	0.01	0.05	0.13	0.26	0.37	0.59	ND	36.2
Toluene	0.3	3,000,000					0	0	1	1	5	2	7.24	2.47	3.54	2.21	NA	4.6	2.45	0.23	0.28	0.42	4.27	8.11	0.99	0.15	0.721
Xylene (total)	0.275	2,750,000					0	0	1	1	1	1	2.15	1.2	4.8	0.57	NA	1.35	1.16	0.08	0.21	0.16	0.74	0.83	0.95	0.08	8.07
Methylene Chloride	3.5	35,000,000					ND	1	1	1	0	1	1.76	0.5	0.33	1.48	NA	0.2	0.18	0.01	0.65	0.05	1.25	0.48	0.14	0.13	0.655
Vinyl Chloride	0.9	9,000,000					ND	ND	1	1	1	1	0.6	0.5	0.5	0.01	NA	0.01	0.01	0.01	0.01	ND	0.01	0.25	ND	ND	12.5
Methane	1.25	12,500,000	2.3	4,980	**	ND	ND	7	2	1	1	2	2.52	3.39	2.9	2.82	NA	3.24	4.25	1.92	3.08	0.88	4,810	3,260	1,720	16,900	5,400

ND = Not Detected

** = Invalid

G-5:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date								Sample Date								Sample Date													
			07/88	11/88	03/89	07/89	11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97		09/97		04/98		09/99		04/01	
			Units:								G5-L	G5-R	G5-L		G5-R	G5-L		G5-R	G5-L		G5-R	G5-L		G5-R	G5-L		G5-R					
			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv		ppbv		ppbv		ppbv			
Benzene	0.325	3,250,000					0.28	0.05	0.7	0.5	0.33	0.5	0.5	0.29	0.18	0.21	0.12	0.71	0.11	0.03	0.25	0.24	0.4	0.05	0.13	0.1	0.26	0.22	0.1	0.03	0.133	0.309
Toluene	0.3	3,000,000					2.49	0.04	0.7	0.5	0.61	0.5	2.85	0.78	0.27	0.76	0.57	2.78	0.39	0.41	1.52	0.58	2.68	0.51	2.07	1.13	0.83	0.75	0.27	0.17	0.769	2.82
Xylene (total)	0.275	2,750,000					0.58	0.03	0.7	0.54	0.43	0.5	0.74	0.29	0.23	0.31	0.32	2.06	0.31	0.01	0.74	0.2	0.89	0.27	0.73	0.58	0.29	0.21	0.09	0.08	0.168	0.277
Methylene Chloride	3.5	35,000,000					ND	1.1	0.7	0.5	0.3	0.5	0.5	0.5	0.06	0.3	0.05	0.1	0.01	0.301	0.84	0.06	0.92	0.28	1.3	0.85	0.16	0.18	0.11	0.12	0.232	0.138
Vinyl Chloride	0.9	9,000,000					ND	ND	0.7	0.5	0.5	0.5	0.5	0.5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.47	0.05	0.01	0.17	ND	ND	ND	0.68	ND	0.222	ND
Methane	1.25	12,500,000	0	2,370	**	ND	ND	5	1.24	0.92	2.26	2.2	2.1	1.29	2.94	2.46	3.99	2.39	1.87	1.89	3.36	0.82	4,600	2,850	1,740	1,110	160	580	12,100	15,500	15,000	14,900

ND = Not Detected

** = Invalid

G-1:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date										
			12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/06	11/07
			Units: ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000	0.11	0.328	0.617	21.1	0.338	50.4	37.2	ND	32	33.1	5.4
Toluene	0.3	3,000,000	0.16	0.309	4.29	0.16	15.4	1.08	50.5	0.39	ND	0.157	ND
Xylene (total)	0.275	2,750,000	ND	0.148	1.353	ND	0.411	ND	ND	ND	ND	0.377	0.178
Methylene Chloride	3.5	35,000,000	0.965	0.115	16.4	0.46	0.342	0.676	0.231	ND	0.127	0.055	ND
Vinyl Chloride	0.9	9,000,000	ND	ND	0.408	60.8	ND	47	32.3	ND	15.7	12.5	0.73
Methane	1.25	12,500,000	4.94	156.00	65.5	20,300	161	170,000	57,900	13,700	64,400	86,900	7,150

ND = Not Detected
** = Invalid

G-2:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date										
			12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/06	11/07
			Units: ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000	0.198	0.201	0.695	NA	0.379	0.095	ND	0.3	ND	ND	ND
Toluene	0.3	3,000,000	0.18	0.062	4.92	NA	13.8	0.12	0.152	0.59	0.038	0.142	0.0425
Xylene (total)	0.275	2,750,000	0.033	0.148	1.778	NA	0.38	ND	ND	0.19	ND	ND	ND
Methylene Chloride	3.5	35,000,000	0.607	0.11	3.06	NA	0.698	0.222	ND	0.08	ND	ND	2.48
Vinyl Chloride	0.9	9,000,000	ND	ND	ND	NA	ND	ND	ND	0.35	ND	ND	ND
Methane	1.25	12,500,000	9.61	15.6	13.2	NA	12.4	5.1	12.5	2.93	4.17	52.1	2.48

ND = Not Detected
** = Invalid

G-3:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date										
			12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/06	11/07
			Units: ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000	ND	ND	0.656	ND	0.233	5.28	ND	0.1	0.337	0.126	ND
Toluene	0.3	3,000,000	0.052	0.045	10.8	ND	1.99	3.44	0.421	0.75	0.807	0.525	0.0908
Xylene (total)	0.275	2,750,000	ND	ND	1.904	ND	0.205	0.68	ND	0.08	0.107	0.038	ND
Methylene Chloride	3.5	35,000,000	ND	ND	0.696	ND	ND	0.449	ND	ND	0.182	0.037	ND
Vinyl Chloride	0.9	9,000,000	ND	ND	0.186	ND	ND	ND	ND	ND	0.672	ND	ND
Methane	1.25	12,500,000	8.84	9.38	12.8	7.86	13.5	7.5	12.9	5.72	5.55	6.85	2.54

ND = Not Detected
** = Invalid

G-4:

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date										
			12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/06	11/07
			Units: ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000	0.178	0.326	0.361	ND	0.29	ND	ND	ND	0.259	ND	ND
Toluene	0.3	3,000,000	0.16	0.563	0.746	0.04	4.55	0.075	0.61	0.18	0.122	0.035	0.0444
Xylene (total)	0.275	2,750,000	ND	ND	0.373	ND	0.22	ND	ND	ND	ND	ND	ND
Methylene Chloride	3.5	35,000,000	0.07	ND	0.208	ND	0.145	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.9	9,000,000	0.19	2.98	7.54	ND	ND	ND	ND	ND	5.65	ND	ND
Methane	1.25	12,500,000	9.35	20.8	12	11.7	13.8	1130	15.9	1.84	3.28	1.54	2.62

ND = Not Detected
** = Invalid

G-5:

Compound		25% LEL (%)	25% LEL (ppbv)	Sample Date																					
				12/02		03/03		09/03		04/04		09/04		04/05		09/05		04/06		09/06		04/06		11/07	
				GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R	GR-L	G5-R
Units:			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
Benzene		0.325	3,250,000	0.199	0.167	0.153	0.169	0.598	0.408	0.19	0.09	0.415	0.337	0.52	ND	ND	NA	0.55	0.17	0.274	0.449	0.122	ND	0.0622	ND
Toluene		0.3	3,000,000	0.189	0.145	0.282	0.220	5.49	3.4	0.46	0.09	10.4	3.28	1.76	0.065	0.306	NA	5.57	0.97	0.496	3.52	0.538	0.084	0.177	0.0848
Xylene (total)		0.275	2,750,000	0.038	ND	0.086	ND	1.339	0.753	0.1	ND	0.441	0.776	0.794	ND	ND	NA	0.67	0.16	ND	0.309	0.024	ND	0.222	ND
Methylene Chloride		3.5	35,000,000	0.076	0.043	0.130	0.051	0.405	9.55	0.61	0.1	0.189	6.21	0.131	ND	ND	NA	5.57	0.97	ND	ND	0.054	ND	ND	ND
Vinyl Chloride		0.9	9,000,000	ND	ND	0.368	ND	0.396	0.218	ND	ND	ND	ND	ND	ND	0.332	NA	ND	ND	ND	ND	ND	ND	0.455	ND
Methane		1.25	12,500,000	9.18	9.37	10.90	11.40	11.2	1	12.6	12.7	12.3	11.8	5.8	5.4	16.3	NA	6.61	5.91	6.64	6.76	5.3	3.77	3.73	2.42

ND = Not Detected
** = Invalid

Form C-5 Ambient Air Sampling

Ambient Air Sample R1

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date									Sample Date												Sample Date										
			11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	05/98	09/99	04/01	12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/07	11/07
			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000		0.24	< 0.80	< 0.5	0.34	< 0.5	0.57	0.17	0.18	0.22	0.08	0.37	0.79	0.29	0.22	0.15	1.24	0.41	0.53	0.36	0.61	0.168	0.408	0.504	0.13	0.424	0.335	0.206	0.55	0.529	0.117	0.182
Toluene	0.3	3,000,000		0.17	< 0.80	< 0.5	1.05	< 0.5	3.15	1.35	0.21	1.29	0.23	2.81	3.31	0.66	0.49	0.21	22.8	3.19	0.59	2.11	3.85	0.138	0.381	7.14	0.25	6.08	1.25	2.04	5.00	2.98	0.199	0.222
Xylene (total)	0.275	2,750,000		0.12	< 0.80	< 0.5	0.57	< 0.5	1.13	0.48	0.16	0.39	0.13	0.98	1.33	0.44	0.43	0.1	3.48	0.7	0.48	0.66	0.889	ND	0.79	1.206	ND	0.727	0.367	0.127	0.48	0.241	0.019	ND
Methylene Chloride	3.5	35,000,000		0.65	1.1	< 0.5	1.94	2.42	19.13	6.91	1.28	2.71	5.53	9.42	0.44	0.3	0.46	0.3	11.1	34.9	1.33	3.31	0.583	0.353	0.381	1.75	0.09	0.454	0.226	0.465	0.32	ND	0.041	ND
Vinyl Chloride	0.9	9,000,000		ND	< 0.80	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.01	< 0.01	< 0.01	0.13	< 0.01	< 0.01	ND	< 0.01	0.06	ND	ND	ND	ND	ND	ND	ND	ND	*	ND	ND	ND	ND	ND
Methane	1.25	12,500,000		ND	1.68	2.16	2.35	2.05	2.63	3.87	3.11	2.41	3.29	2.54	4.16	3.06	3.5	1.04	48,000	3,290	1,710	16,500	15,900	11,400	13,000	11,000	13,000	11,600	6,800	18,200	6,320	7,880	4,840	6,370

ND = Not Detected

* Not analyzed for Vinyl Chloride

Ambient Air Sample R2

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date									Sample Date												Sample Date										
			11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	06/97	09/97	05/98	09/99	04/01	12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/07	11/07		
			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	
Benzene	0.325	3,250,000		0.36	< 0.75	< 0.5	0.54	< 0.5	0.52	0.22	0.57	0.21	0.12	0.5	0.68	0.19	0.21	0.15	0.65	0.35	0.58	0.5	0.601	0.214	0.353	0.677	0.12	0.45	0.308	ND	0.63	0.473	0.125	0.191
Toluene	0.3	3,000,000		0.17	< 0.75	< 0.5	4.07	0.87	4.79	1.21	1.79	1.51	0.36	3.49	3.32	0.45	0.64	0.24	1.15	2.36	0.64	2.06	3.23	0.232	0.739	9.27	0.14	8.69	1.18	1.36	3.68	2.59	0.268	0.224
Xylene (total)	0.275	2,750,000		0.61	< 0.75	< 0.5	1.54	< 0.5	1.48	0.61	2.09	0.42	0.19	1.44	1.37	0.45	0.29	0.11	0.66	1.11	0.51	0.89	0.766	0.065	0.415	1.606	ND	1.436	0.211	ND	0.11	0.212	0.048	ND
Methylene Chloride	3.5	35,000,000		3.49	3.1	< 0.5	< 0.3	6.53	1.81	0.53	0.57	0.37	0.52	0.6	0.65	< 0.01	0.56	0.08	0.62	3.9	2.66	13.7	0.683	0.494	0.291	0.99	ND	5	0.33	0.465	0.37	0.177	0.071	ND
Vinyl Chloride	0.9	9,000,000		ND	< 0.75	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	*	ND	ND	ND	ND	ND
Methane	1.25	12,500,000		1.8	2.07	1.57	1.99	2.22	2.32	3.9	3.41	2.49	2.94	2.45	4.51	3.33	3.68	0.9	820	3,540	2,040	13,700	14,600	11,300	13,300	12,000	11,900	13,400	6,900	19,400	6,030	7,230	4,800	6,070

ND = Not Detected

Ambient Air Sample U1

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date									Sample Date												Sample Date										
			11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	05/98	09/99	04/01	12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/07	11/07
			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000		0.23	< 0.80	0.62	0.36	< 0.5	< 0.5	0.14	0.2	0.18	0.1	0.31	0.54	0.09	0.15	0.18	7.02	0.8	0.67	0.23	0.558	0.192	0.488	0.54	ND	0.417	ND	ND	0.62	0.422	0.111	0.175
Toluene	0.3	3,000,000		0.15	< 0.80	< 0.5	1.09	< 0.5	2.15	0.74	0.21	1.15	0.55	2.23	2.83	0.3	0.43	0.31	11.3	3	1.36	0.55	4.38	0.239	0.888	6.02	0.79	7.77	1.03	0.9	5.05	2.7	0.18	0.256
Xylene (total)	0.275	2,750,000		0.09	< 0.80	< 0.5	0.71	< 0.5	0.79	0.22	0.23	0.25	0.14	1	1.21	0.15	0.25	0.15	10.54	1.26	1.02	0.42	0.859	0.06	0.509	1.177	ND	5.44	0.145	ND	0.56	0.146	ND	0.03
Methylene Chloride	3.5	35,000,000		0.53	< 0.80	- 11	< 0.3	1.01	14.53	0.74	0.11	0.2	0.66	0.89	0.78	< 0.01	0.51	0.21	0.86	15.2	1.82	0.32	0.574	0.01	0.113	0.916	0.44	0.211	0.236	0.263	0.27	0.115	0.154	0.088
Vinyl Chloride	0.9	9,000,000		ND	< 0.80	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*	ND	ND	ND	ND	ND
Methane	1.25	12,500,000		0.7	1.66	2.29	2.75	2.04	2.27	3.63	2.77	2.51	3.05	2.29	4.47	2.95	3.4	0.89	750	4.17	1,680	20,600	23,300	11,400	12,200	13,700	9,700	12,700	7,700	17,600	5,600	7,440	4,710	5,400

ND = Not Detected

NA = Not Available (sample container failed acceptance criteria)

Ambient Air Sample A2

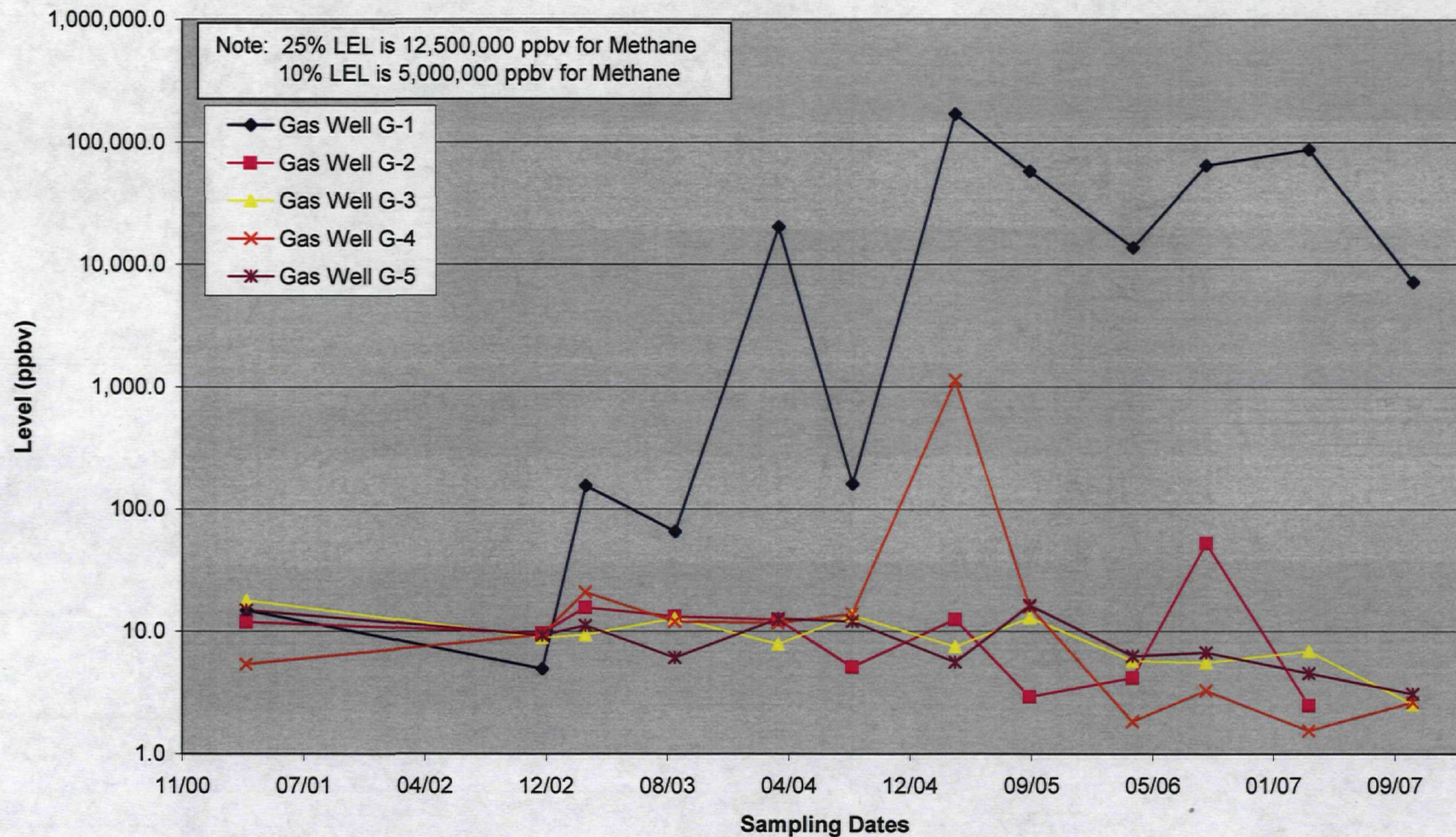
Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date									Sample Date												Sample Date										
			11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	05/98	09/99	04/01	12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/07	11/07
			Units:									ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000	0.29	0.21	< 0.80	0.6	0.39	< 0.5	< 0.5	0.21	0.18	0.22	0.12	0.55	0.65	0.09	0.2	0.13	0.55	0.66	0.65	0.31	0.499	0.146	0.236	NA	ND	0.368	0.33	0.177	0.65	0.478	0.134	0.187
Toluene	0.3	3,000,000	0.56	0.15	0.91	< 0.5	1.09	< 0.5	1.95	1.57	0.17	0.58	0.32	6.08	2.61	0.23	0.64	0.17	5.9	8.36	0.97	1.96	3.28	0.14	0.229	NA	0.06	5.44	3.19	2.18	6.38	3.16	0.149	0.377
Xylene (total)	0.275	2,750,000	0.37	0.11	< 0.80	< 0.5	0.72	< 0.5	1.49	0.49	0.15	0.36	0.2	1.62	1.14	0.08	0.46	0.08	0.95	2.24	0.85	0.52	0.659	ND	ND	NA	ND	0.605	0.398	ND	0.5	7.86	0.024	0.088
Methylene Chloride	3.5	35,000,000	ND	1.96	1.7	< 0.5	< 0.3	< 0.5	0.56	2.8	0.07	0.25	0.06	0.41	0.47	< 0.01	1.79	1.02	4.05	22.3	1.28	1.57	0.349	0.21	0.115	NA	ND	1.56	1.11	0.126	0.46	ND	0.061	0.168
Vinyl Chloride	0.9	9,000,000	ND	ND	< 0.80	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	ND	< 0.01	0.02	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	*	ND	ND	ND	ND
Methane	1.25	12,500,000	ND	11.4	2.25	2.25	2.3	2	3.08	3.92	3.34	2.59	3.29	2.68	4.28	5.21	5.52	0.99	5,340	3,320	1,790	16,800	15,600	10,700	13,400	NA	11,800	12,400	6,900	13,200	7,260	7,860	6,210	5,510

ND = Not Detected

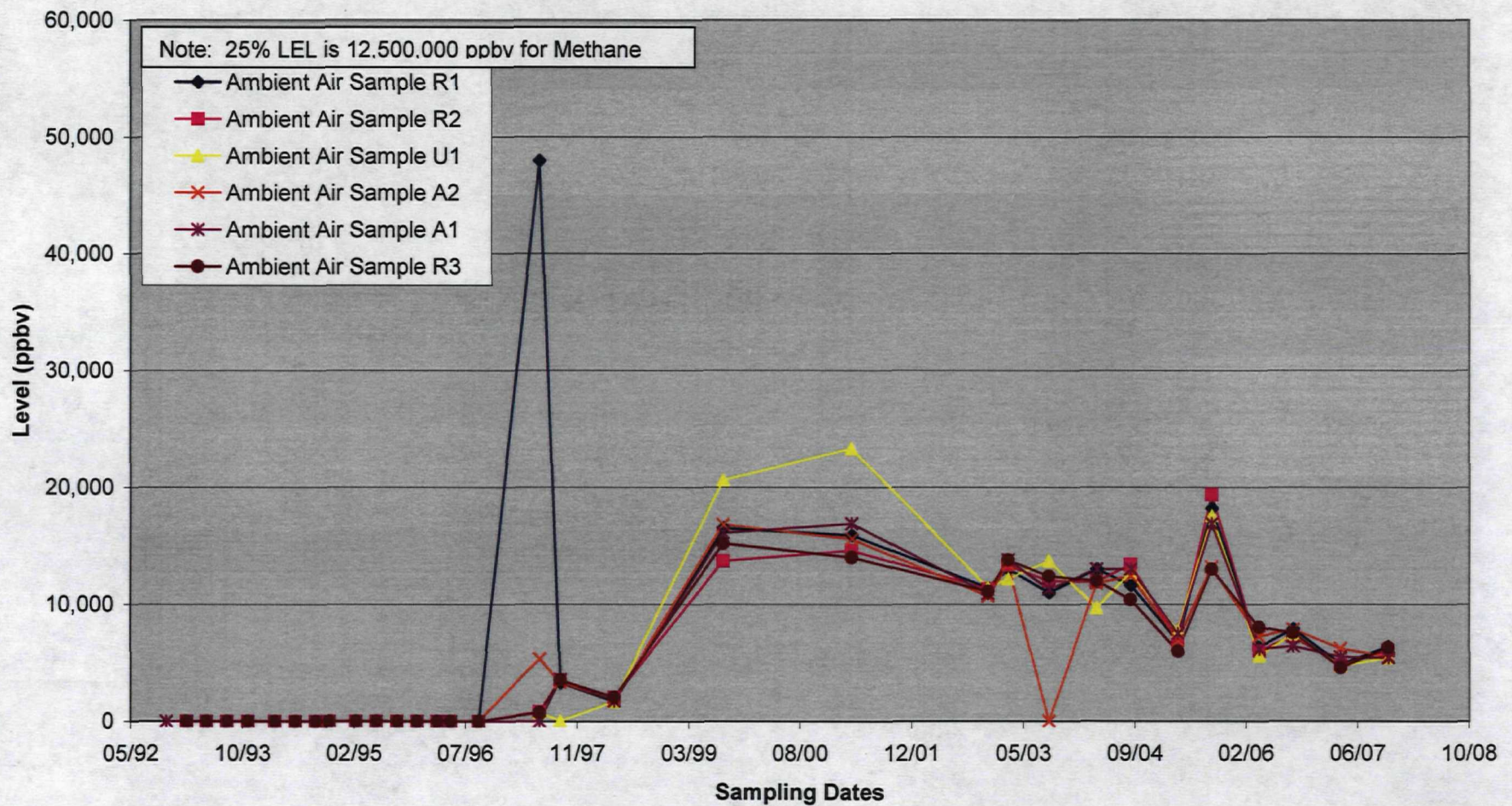
Ambient Air Sample A1

Compound	25% LEL (%)	25% LEL (ppbv)	Sample Date									Sample Date											Sample Date											
			11/92	02/93	05/93	08/93	11/93	03/94	06/94	09/94	11/94	03/95	06/95	09/95	12/95	03/96	05/96	09/96	06/97	09/97	05/98	09/99	04/01	12/02	03/03	09/03	04/04	09/04	04/05	09/05	04/06	09/06	04/07	11/07
Units:			ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv	ppbv
Benzene	0.325	3,250,000	38	0.19	< 0.08	< 0.5	0.31	< 0.5	< 0.5	2	2.67	0.21	0.11	0.31	0.57	0.08	0.22	0.14	VOID	0.6	0.65	0.44	0.471	0.212	0.249	0.497	0.104	0.325	ND	ND	0.34	0.379	0.1	0.179
Toluene	0.3	3,000,000	1.59	0.14	< 0.08	5.3	1.03	< 0.5	15.27	8.5	10.03	2.28	0.3	2.52	3.5	0.016	0.67	0.15	VOID	6.01	0.94	3.78	3.02	0.374	0.278	6.73	0.17	5.18	0.244	1.42	2.73	2.8	0.094	0.144
Xylene (total)	0.275	2,750,000	0.63	0.12	< 0.08	< 0.5	0.58	< 0.5	1.58	3.87	13.79	0.53	0.14	0.78	1.39	0.07	0.49	0.05	VOID	1.56	0.87	1.13	0.598	0.08	0.059	1.195	ND	0.793	ND	ND	0.27	0.159	ND	ND
Methylene Chloride	3.5	35,000,000	ND	< 0.02	< 0.08	11	< 0.3	1.92	15.91	0.51	0.79	3.37	0.34	1.97	1.13	< 0.01	2.22	0.36	VOID	11.8	1.27	4.78	0.382	2.98	0.099	0.818	0.08	2.2	ND	0.191	0.17	0.281	0.048	ND
Vinyl Chloride	0.9	9,000,000	ND	ND	< 0.08	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	ND	VOID	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	*	ND	ND	ND	ND
Methane	1.25	12,500,000	ND	0.03	1.92	1.49	2.06	2.34	2.53	3.86	3.33	2.5	3.38	2.46	3.97	5.2	3.76	1.14	VOID	3,590	1,720	16,100	16,900	10,900	13,800	11,300	13,000	13,000	7,500	16,900	6,150	6,420	5,470	5,400

Methane Measurements



Methane Measurements



Form C-7
Methane Measurements
Ambient Air

LEE'S LANE LANDFILL
Jefferson County
Louisville, Kentucky
4th Five-Year Review Meeting

17 March 2008

Name	Agency	Phone Number	e-Mail
<u>Karen Rabek</u>	<u>COE</u>	<u>(502) 315-4328</u>	<u>karen.v.rabek@usarmy.mil</u>
<u>Nat Peters</u>	<u>COE</u>	<u>(502) 315-6333</u>	<u>nat.peters@us.army.mil</u>
<u>KYLE HAGEN</u>	<u>SMG</u>	<u>(859) 231-8936</u>	<u>Kyleh@smithmanage.com</u>
<u>Scott Smith</u>	<u>SMG</u>	<u>859-23-8936</u>	<u>Scott.R.Smith@Smithmanage.com</u>
<u>Wesley Turner</u>	<u>DWM/SF</u>	<u>502-564-6716</u>	<u>wesley.turner@Ky.gov</u>
<u>Daniel Phelps</u>	<u>DWM/SF</u>	<u>502 564-6716x258</u>	<u>Daniel.PHELPS@KY.GOV</u>
<u>Rick Watkins</u>	<u>MSD</u>	<u>502-540-6828</u>	<u>WATKINSE@MSDLINKV.ORG</u>

**Notice of
Five-Year Review
Lees Lane Landfill
Jefferson County,
Kentucky
Former Superfund
Site**

The U.S. Army Corps of Engineers in conjunction with the U.S. Environmental Protection Agency (EPA) is currently conducting a five-year review of the Lees Lane Landfill, a former Superfund Site. The purpose of a five-year review is to evaluate the implementation and performance of remedies in order to determine if the remedies are, or will be, protective of human health and the environment. The site was placed on the National Priorities List (NPL) in September 1980 due to migration of methane gas from the landfill into residential areas. A gas subsurface venting system was installed by the Kentucky Department of Hazardous Materials and Waste Management in October 1980. A Remedial Investigation/Feasibility Study was completed in April 1986 and the Enforcement Decision Document (EDD) was signed in September 1988. The site was deleted from the NPL on April 25, 1996. To date three five-year reviews have been performed; in 1993, in 1998, and in 2003. It is anticipated that this five-year review report will be completed in June 2008.

For more information, contact:
Karen Rabek
U.S. Army Corps of Engineers
600 Dr. Martin Luther King, Jr. Plaza
Louisville, Kentucky 40202
502-325-4939
www.usace.army.mil

**Form C-9
Newspaper Notification**

NOTICE OF FIVE-YEAR REVIEW

**Lees Lane Landfill
Jefferson County, Kentucky
Former Superfund Site**

The U.S. Army Corps of Engineers, in conjunction with the U. S. Environmental Protection Agency (EPA), is currently conducting a five-year review of the Lees Lane Landfill, a former Superfund Site. The purpose of a five-year review is to evaluate the implementation and performance of remedies in order to determine if the remedies are, or will be, protective of human health and the environment. The site was placed on the National Priorities List (NPL) in September 1983 due to migration of methane gas from the landfill into residential areas. A gas subsurface venting system was installed by the Kentucky Department of Hazardous Materials and Waste Management in October 1980. A Remedial Investigation/Feasibility Study was completed in April 1986 and the Enforcement Decision Document (EDD) was signed in September 1986. The site was deleted from the NPL on April 25, 1996. To date three five-year reviews have been performed; in 1993, in 1998, and in 2003. It is anticipated that this five-year review report will be completed in June 2008. For more information, contact:

Karen Rabek
U.S. Army Corps of Engineers
600 Dr. Martin Luther King, Jr. Place
Louisville, Kentucky 40202
502-315-6328
karen.v.rabek@usace.army.mil

**Form C-10
Neighborhood Flyer**

5-Year Review Questionnaire for Govt. Officials

Site Lee's Lane Landfill

City/State Louisville / Kentucky

Date: 4/3/08 Phone No. 502-564-6716

Name Wesley Turner

Address KY Env. - Public Protection Cabinet, Dept. of Env. Protection
Div. of Waste Management Superfund Branch 14 Reilly Rd.

What is your overall impression of the project? Not very satisfied Frankfort, KY 40601

Last 5-Year Review issues not addressed - gas collection system
Not certain that site has been fully characterized from buried
drums. No VOCs shown in GW. Are well screens. Surprised GW not impacted.

Have there been routine communications or activities conducted by your office regarding the Site? [Site visits, Inspections, reporting activities, etc.] If so, please give purpose and results. If complaints are received by citizens, the state responds.

Get reports from MSD regularly.

Have not communicated w/ EPA since last 5-YR Review.

Have there been any complaints, violations, or other incidents related to the Site requiring a response by your office? If so, please give details of the events and results.

Complaint of rubber material coming up from ground - went out in June 2005
rubber exposed by erosion - sampled soil that looked like
fly ash material - got PAHs.

Do you feel well informed about the Site's activities and progress?

No, do not know what EPA is doing about last 5-YR
Review Recommendations

Do you think clean up activities at the Site have had a positive or negative impact on the community? In what ways? positive in that water heaters are no

longer catching on fire.

Do you have any comments, suggestions, or recommendations regarding the Site's management or operation? need to know what is going on

around G-1 & G-2.

Need to address trespassing before someone gets hurt.

Interview conducted by: Karen Rabek

Date conducted: 4/3/08

Form C-11
Telephone Interviews

5-Year Review Questionnaire for Govt. Officials

Site Lee's Lane Landfill

City/State Louisville / Kentucky

Date: 4/2/08 Phone No. 502-540-6828

Name Richard Watkins

Address MSD 3050 Commerce Center Place
Louisville, KY 40211-1972

What is your overall impression of the project? Not sure how to answer
MSD came into the picture after the site became a
superfund site.

Have there been routine communications or activities conducted by your office regarding the Site? [Site visits, Inspections, reporting activities, etc.] If so, please give purpose and results. MSD responsible for landfill cap maintenance,
monitoring ambient air and groundwater
as prescribed.

Have there been any complaints, violations, or other incidents related to the Site requiring a response by your office? If so, please give details of the events and results. ongoing trespassing
nothing else.

Do you feel well informed about the Site's activities and progress? yes nothing happens without my being aware

Do you think clean up activities at the Site have had a positive or negative impact on the community? In what ways? positive impact - shows community that
MSD takes care of responsibilities of the Consent Decree.

Do you have any comments, suggestions, or recommendations regarding the Site's management or operation? Not now.

Interview conducted by: Karen Rabek - USACE

Date conducted: 4/2/08

C-11

5-Year Review Questionnaire

Site Lee's Lane Landfill

City/State Louisville, KY

Date: _____ Phone No. _____

Name of Citizen _____

Address _____

How long have you lived near the Site? _____

Are you familiar with EPA activities over the past years? _____

Do you still have any concerns regarding EPA clean up activities of the Site? _____

Overall, have you been pleased or displeased with EPA actions at this Site? _____

Do you think you have been adequately informed about clean up activities at the Site? _____

Is there any information about the Site that you would like to share with us that would assist in our 5-year review of site activities? _____

Is there someone else that you would like to recommend we contact for more information? _____

Do you have any suggestions that EPA can implement to improve communications with the public? _____

Form C-12
Questionnaire



MSD

May 23, 2005

Mr. Femi Akindele
Remedial Project Manager
Kentucky/Tennessee Section
U.S. Environmental Protection Agency
Region IV
61 Forsyth Street
Atlanta, GA 30303

Re: Lee's Lane Landfill – Landfill Gas (LFG) Collection System Investigation

Dear Mr. Akindele

Per your request, please find attached copy of the Lee's Lane Landfill inspection of the (LFG) collection system, that was performed by SCS Engineers. SCS has made recommendation for repair/replacement of system per plans that you are now reviewing.

Should you have further questions, please advise..

Sincerely,

Richard H. Watkins, Sr.
Maintenance Assistant
RHW/rw

Enc.

cc: Kentucky National Resource Environment Protection Cabinet
Mr. Ken Logsdon, Division of Waste Management

Form C-13

SCS Engineers Investigation Letter Report

SCS FIELD SERVICES

May 6, 2004
File No. 05203029.00

SENT VIA FAX 5/6/04
Fax no. (502) 540-6970

Mr. Richard H. Watkins
Louisville and Jefferson Metropolitan Sewer District
3050 Commerce Center Place
Louisville, Kentucky 40211

Subject: Lee's Lane Landfill
Landfill Gas (LFG) Collection System Investigation

Dear Mr. Watkins:

SCS Engineers (SCS) was contracted by the Louisville and Jefferson County Metropolitan Sewer District (District) to perform a maintenance inspection of the LFG collection system. The inspection has two primary objectives:

- Identify the portions of the system that are functioning, the portions that are not, and providing guidance to the District for remediation.
- Perform fieldwork with a District maintenance staff member to show the inspection and system management process that we are carrying out.

INTRODUCTION

In about 1980 SCS designed and provided construction oversight of the original system that was installed to control off-site LFG at this former National Priority List site. The system consisted of 31 vertical extraction wells, connecting piping, a blower that free-vents to the atmosphere, and LFG monitoring probes (G1 to G5).

In 1985 and 1986 SCS conducted operation evaluations and recommended remedial actions, which were subsequently carried out by District staff. Limited operation and maintenance (O&M) has been performed on the LFG system since 1986, except for the blower station which is currently maintained by District maintenance staff, and several LFG monitoring probes continue to be monitored by District staff.

ON-SITE ACTIVITIES

During our site visit the week of February 2, 2004, SCS Field Services (SCS-FS) had determined that at least two substantial blockages exist in the LFG collection header line at the subject site and that further investigation was warranted. Pressure readings indicated blockages located between moisture traps (MT) 16 and 17 and between MT 23 and 24. Data collected during the site visits are presented in Table 1. The District approved the additional investigation by SCS-FS to install temporary, above-grade jumper-lines bypassing these blockages to permit further investigation concerning the integrity of the LFG collection system.



Mr. Richard H. Watkins
May 6, 2004
Page 2

On March 24, 2004, SCS-FS visited the site, installed the two temporary jumper-lines, and monitored the vacuum distribution of the LFG collection system. One jumper-line was installed on the north header line and one jumper-line was installed on the south header line. Access to the LFG blower building and the LFG monitoring probes that are located along the site's eastern property boundary was not available on March 24. SCS-FS returned to the site on March 26, 2004, to continue the investigation. Data collected during the site visits is presented in Table 1.

CONCLUSIONS AND RECOMMENDATIONS

Results of the jumper-line installation on the northern and southern header lines were disappointing, indicating blockages in addition to those identified in February exist. The vacuum-pressure gradient throughout the system was extended, at best, an additional 300 feet with the jumper-lines. Thus, approximately 2/3 of the total system is not being influenced by the blower and the results indicated marginally positive or minimum negative pressures as shown in Table 1.

On the southern header line, the jumper was installed between MT 16 and 17. On March 24, 2004, the jumper-line had a vacuum of -16.6 inches of water column (in-W.C.) at MT 17 and -15.4 in-W.C. at MT 16. Gas extraction well (EW) 16, which is located 70 feet from MT 16 had a vacuum of -0.1 in-W.C.. Moisture trap 15, which is located 100 feet upstream from MT 16, exhibited 0.0 in-W.C. pressure. Thus, the vacuum readings indicated that an additional blockage or breakage exists between MT 15 and 16.

Similar results were obtained with the northern jumper installed over the Lee's Lane access road between MT 23 and 24. The -16.8 in-W.C. vacuum at MT 23 delivered -16.0 in-W.C. negative pressure to the upstream MT 25, -11.2 in-W.C. to EW 25, and 0.0 in-W.C. to MT 26. These vacuum readings indicated that a blockage or breakage also exists between EW 25 and MT 26.

It is highly probable that additional blockage or breakage exists in the upstream portions of the two header manifolds that, without installation of supplemental jumper-lines, cannot be identified. SCS believes it would not be cost effective for the District to invest further time, effort, or expense to investigate these probable locations in a system that is obviously in need of repairs.

The extraction wells, on average, were drilled to depths of approximately 25 feet. Of the system's thirty-one extraction wells, twenty-five could be investigated for liquid levels and/or boring depths. Three EW's, 19, 20 and 29 were covered by standing surface water and could not be sounded for depths. Twelve of the EW's which could be monitored had liquid levels and/or depths between 22 and 25 feet. Seven extraction wells had liquid levels and/or casing depths of 15 to 22 feet. Two EW's exhibited liquid levels between 10 and 15 feet and three EW's had liquid levels from 0 to 10 feet. The water can be a barrier to gas migration and block the perforations in the extraction well pipe. At EW 17, the casing was sheared off at 3.3 feet allowing the casing to spin when attempting to unscrew the 4 inch well cap. Extraction well sounding data is presented in the comments section of Table 1.

Mr. Richard H. Watkins
May 6, 2004
Page 3

Monitoring data did not indicate methane in four of the five LFG probe locations installed along the eastern property boundary or the adjacent neighborhood. However, probe G1 adjacent to the blacktop access road south of Lee's Lane and Pulman Road exhibited 5.9 to 7.5 percent methane by volume. These concentrations are above the lower explosive limit for methane and merit concern. This location coincides with and is directly adjacent to the blocked southern portion of the LFG collection system which is not currently influenced by the full negative pressure applied to the collection manifold by the blower, see Figure 1 for LFG monitoring probe locations.

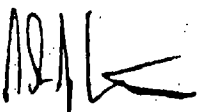
Due to the loss of vacuum throughout the majority of the LFG collection system and the concentrations of methane in probe G1, SCS recommends replacement of the collection manifold. The majority of the extraction wells are not currently being influenced by the blower, a phased construction approach followed by system re-evaluation would appear to be the most prudent course of action. This concept would allow determination of the effectiveness of the existing extraction wells once the negative pressure gradient has been re-established throughout the LFG collection system. The existing system is approximately 25 years old, which is at or beyond the typical useful life for a LFG collection system. Pumping out the liquids in the watered-in locations may recover the ability of these EW's to apply the negative pressure gradient to their immediate area, increasing their radius of influence and possibly eliminating the cost associated with installation of replacement wells.

*do it
if not
done*

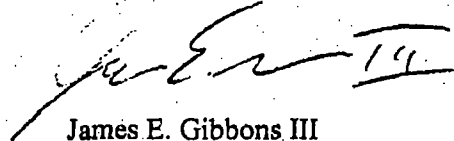
By decreasing the existing 4.0 percent slope of the LFG collection header piping to 1.0 percent and taking advantage of existing grade, the number of traps can be diminished and we estimated 7 in the budgetary construction estimate. The rough budgetary construction estimate with the low and high range was prepared by SCS-FS. This budget estimate does not include engineering and other assumptions which are identified on Exhibit A. The estimated high range cost includes new EW installations. This budgetary construction cost estimate range is \$226,550 (no EW's) to \$327,750 (new EW's), see Exhibit A.

SCS-FS appreciates this opportunity to perform the investigative effort on this challenging project and welcomes any request to explain or clarify this letter report.

Respectfully yours,



FOR Larry D. Thompson
Project Superintendent
SCS FIELD SERVICES



James E. Gibbons III
Project Manager
SCS FIELD SERVICES

cc: Anthony DiPuccio, P.E. - SCS Engineers
LDT/JEG:jeg
I:\user\0735JEG\My Documents\WPDOCS\05203029.00\Investigation Report.doc

**TABLE 1. LEE'S LANE LANDFILL
FEBRUARY AND MARCH 2004 MONITORING RESULTS**

Location	Date	Time	Methane (% vol.)	Carbon Dioxide (% vol.)	Oxygen (% vol.)	Balance Gas (% vol.)	Pressure (in. W.C.)	Flow (scfm)	Temp. (deg. F)	Comments
Blower Inlet	02/03/04	10:15 AM	0.5	6.7	13.5	79.3	-46.7		46	
Blower Outlet	02/03/04	10:36 AM	0.5	6.8	13.8	78.9	0.0		58	
	02/04/04	3:21 PM	1.1	7.3	12.6	79.0	0.0	154	80	
EW 01	02/04/04	10:05 AM	ND	ND	20.4	79.6	-0.6			23.7 ft. to liquid
EW 02	02/04/04	10:44 AM	0.3	4.7	16.1	78.9	-0.5			17.5 ft. to liquid
EW 03	02/04/04	10:29 AM	ND	ND	20.3	79.7	-0.4			23.7 ft. to liquid
EW 04	02/04/04	11:01 AM	0.2	1.7	16.6	81.5	-0.5			13.2 ft. to liquid
EW 05	02/04/04	11:20 AM	0.2	2.5	16.0	81.3	-0.5			23.0 ft. to liquid
EW 06	02/03/04	6:46 PM	ND	0.4	19.9	79.7	-0.6			23.5 ft. to liquid
EW 07	02/03/04	6:33 PM	ND	ND	20.3	79.7	-0.6			minimal vacuum
EW 08	02/04/04	11:49 AM	ND	0.1	19.9	80.0	-0.2			minimal vacuum
EW 09	02/03/04	6:00 PM	ND	0.6	20.0	79.4	-0.6			minimal vacuum
EW 10	02/03/04	5:30 PM	0.2	0.8	20.3	78.7	-0.6			24.2 ft. to liquid
EW 11	02/03/04	5:50 PM	ND	1.0	19.7	79.3	-0.6			24.65 ft. to liquid
EW 12	02/04/04	12:10 PM	ND	0.7	19.3	80.0	-0.2			24.8 ft. to bottom
EW 13	02/03/04	2:53 PM	0.7	1.3	19.6	78.4	-0.4			24.4 ft. to liquid
EW 14	02/03/04	2:40 PM	ND	4.8	11.6	83.6	-0.3			22.4 ft. to bottom
EW 15	02/03/04	2:35 PM	ND	ND	20.4	79.6	-0.5			17.7 ft. to bottom

Location	Date	Time	Methane (% vol.)	Carbon Dioxide (% vol.)	Oxygen (% vol.)	Balance Gas (% vol.)	Pressure (in-W.C.)	Flow (scfm)	Temp. (deg. F)	Comments
EW 16	02/03/04	2:29 PM	ND	ND	20.3	79.7	-0.4			17.2 ft. to bottom;
	03/24/04	12:05 PM	ND	ND	21.2	78.8	-0.1			no liquids
EW 17	02/04/04	12:35 PM	ND	0.1	19.9	80.0	0.0			Casing turns;
	03/24/04	11:50 AM	ND	0.1	21.2	78.7	-6.6			sheared @ 3.3'
EW 18	02/03/04	2:11 PM	ND	4.0	16.7	79.3	-10.8			16.7 ft. to liquid;
	03/24/04	11:37 AM	ND	3.4	16.9	79.7	-8.8			20.6 ft. to bottom
EW 19	02/03/04	*	*	*	*	*	*			under surface water
EW 20	02/03/04	*	*	*	*	*	*			under surface water
EW 21	02/03/04	1:43 PM	ND	1.8	18.9	79.3	0.0			2.8 ft. to liquid
EW 22	02/03/04	*	*	*	*	*	*			23.8 ft. to liquid
EW 23	02/03/04	11:33 AM	3.9	11.7	8.5	75.9	-13.0			23.6 ft. to liquid
EW 24	02/03/04	11:47 AM	ND	3.5	18.2	78.3	-0.9			minimal vacuum;
	03/24/04	10:25 AM	ND	2.1	18.2	79.7	-6.9			16.7 ft. to bottom
EW 25	02/03/04	12:09 PM	ND	ND	20.5	79.5	-1.2			24.2 ft. to liquid;
	03/24/04	10:33 AM	0.8	13.5	6.1	79.6	-11.2			24.8 ft. to bottom
EW 26	02/03/04	12:21 PM	ND	0.6	19.6	79.8	-0.1			minimal vacuum;
	03/24/04	10:46 AM	ND	0.1	20.9	79.0	0.0			16.7 ft. to bottom
EW 27	02/03/04	12:33 PM	ND	3.6	18.1	78.3	0.0			2.8 ft. to liquid; 15 ft. to bottom
EW 28	02/03/04	*	*	*	*	*	*			surface water;
										8.15 ft. to liquid; 16.25 ft. to bottom
EW 29	02/03/04	*	*	*	*	*	*			under surface water
EW 30	02/03/04	12:59 PM	ND	0.4	19.7	79.9	0.0			13.5 ft. to liquid
EW 31	02/03/04	1:08 PM	ND	0.1	20.3	79.6	0.6			16.2 ft. to bottom

Location	Date	Time	Methane (% vol.)	Carbon Dioxide (% vol.)	Oxygen (% vol.)	Balance Gas (% vol.)	Pressure (in. W.C.)	Flow (scfm)	Temp. (deg. F)	Comments
S Header 1	02/03/04	10:22 AM	0.7	7.0	13.4	78.9	-20.0		50	EW 1-21 header
N Header 2	02/03/04	10:31 AM	ND	ND	20.7	79.3	-20.1		43	EW 22-31 header
MT 01	02/04/04	9:42 AM	ND	ND	20.6	79.4	-0.6			minimal vacuum
MT 02	02/03/04	7:14 PM	ND	ND	20.3	79.7	-0.7			minimal vacuum
MT 03	*	*	*	*	*	*	*			unable to remove lid
MT 04	02/03/04	7:01 PM	ND	ND	20.3	79.7	-0.6			minimal vacuum
MT 05	02/03/04	6:53 PM	ND	ND	20.2	79.8	-0.6			minimal vacuum
MT 06	02/03/04	6:39 PM	ND	0.3	20.2	79.5	-0.6			minimal vacuum
MT 07	02/03/04	6:22 PM	ND	ND	20.3	79.7	-0.7			23.9 ft. to liquid
MT 08	02/03/04	6:14 PM	ND	0.4	20.1	79.5	-0.7			24.2 ft. to liquid
MT 09	02/03/04	5:55 PM	0.1	0.4	20.0	79.5	-0.6			24.2 ft. to liquid
MT 10	02/03/04	5:24 PM	0.2	ND	20.4	79.4	-0.5			minimal vacuum
		5:37 PM	0.1	ND	20.4	79.5	-0.6			
MT 11	02/03/04	5:15 PM	0.1	0.7	20.4	78.8	-0.5			
MT 12	02/03/04	5:07 PM	0.1	ND	20.5	79.4	3.7			no cap
		5:10 PM	0.1	0.1	20.3	79.5	-0.4			minimal vacuum
MT 13	*	*	*	*	*	*	*			unable to remove lid
MT 14	02/03/04	2:48 PM	ND	0.8	17.8	81.4	-0.3			broken cap w/plug
MT 15	03/24/04	12:20 PM	ND	ND	21.0	79.0	0.0			Casing turns

Location	Date	Time	Methane (% vol.)	Carbon Dioxide (% vol.)	Oxygen (% vol.)	Balance Gas (% vol.)	Pressure (in-W.C.)	Flow (scfm)	Temp. (deg. F)	Comments
MT 16	02/03/04	2:23 PM	ND	0.3	19.4	80.3	0.0			minimal vacuum
	03/24/04	12:00 n	ND	ND	21.0	79.0	-15.4			
MT 17	02/03/04	2:16 PM	ND	0.3	20.1	79.6	-19.8			
	03/24/04	11:45 AM	ND	0.4	20.9	78.7	-16.6			3.7 ft. to liquid
MT 18	02/03/04	2:07 PM	ND	4.7	16.2	79.1	-20.1			
	03/24/04	11:31 AM	ND	1.0	19.9	79.1	-16.6			
MT 19	02/03/04	2:01 PM	ND	4.4	16.5	79.1	-20.5			
MT 20	02/03/04	1:53 PM	0.1	4.4	16.8	78.7	-22.0			
MT 21	02/03/04	1:37 PM	0.1	0.1	20.5	79.3	-20.7			
MT 22	*	*	*	*	*	*	*			unable to open cap
MT 23	02/03/04	11:42 AM	ND	0.1	20.6	79.3	-19.6			
	03/24/04	10:12 AM	0.8	11.7	7.7	79.8	-16.8			
MT 24	02/03/04	11:59 AM	ND	0.3	20.3	79.4	-1.2			minimal vacuum
MT 25	02/03/04	12:16 PM	0.8	7.7	11.0	80.5	-1.2			minimal vacuum
	03/24/04	10:38 AM	ND	0.7	20.7	78.6	-16.0			
MT 26	02/03/04	12:26 PM	ND	1.3	19.1	79.6	-0.1			minimal vacuum
	03/24/04	10:51 AM	ND	1.2	18.9	79.9	0.0			no vacuum
MT 27	02/03/04	12:39 PM	ND	0.4	19.6	80.0	-0.2			minimal vacuum
MT 28	*	*	*	*	*	*	*			under surface water
MT 29	02/03/04	12:53 PM	ND	0.6	19.7	79.7	-2.6			minimal vacuum
MT 30	02/03/04	1:04 PM	ND	2.6	16.9	80.5	0.1			no vacuum

Location	Date	Time	Methane (% vol.)	Carbon Dioxide (% vol.)	Oxygen (% vol.)	Balance Gas (% vol.)	Pressure (in-W.C.)	Flow (scfm)	Temp. (deg. F)	Comments
Probe G1A	03/26/04	4:51 PM	6.1	8.8	ND	85.1	0.2			
Probe G1B	03/26/04	4:53 PM	7.5	8.6	ND	83.9	0.2			
Probe G1C	03/26/04	4:57 PM	5.3	6.6	5.0	83.1	0.2			
Probe G1D	03/26/04	5:00 PM	7.5	9.0	ND	83.5	0.2			
Probe G2A	03/26/04	4:29 PM	ND	2.7	14.1	83.2	0.1			
Probe G2B	03/26/04	4:33 PM	ND	7.0	8.3	84.7	0.1			
Probe G2C	03/26/04	4:35 PM	ND	0.3	18.8	80.9	0.0			
Probe G2D	03/26/04	4:38 PM	ND	1.3	17.1	81.6	0.0			
Probe G3A	03/26/04	4:08 PM	ND	ND	20.4	79.6	-0.1			
Probe G3B	03/26/04	4:11 PM	ND	2.3	16.9	80.8	-0.1			
Probe G3C	03/26/04	4:14 PM	ND	4.6	14.9	80.5	-0.2			
Probe G3D	03/26/04	4:17 PM	ND	ND	20.4	79.6	-0.2			
Probe G4A	03/26/04	3:45 PM	ND	7.5	6.4	86.1	0.1			
Probe G4B	03/26/04	3:49 PM	ND	10.9	2.3	86.8	0.0			
Probe G4C	03/26/04	3:54 PM	ND	ND	20.4	79.6	0.1			
Probe G4D	03/26/04	3:57 PM	ND	0.2	19.7	80.1	0.1			
Probe G5	03/26/04	5:21 PM	ND	ND	20.1	79.9	0.0			
		5:23 PM	ND	ND	20.3	79.7	0.0			

% vol. Percent by volume
 in-W.C. Inches of water column
 ND None Detected
 scfm Standard cubic feet per minute
 deg F Degrees in Fahrenheit

EW Extraction well
 MT Moisture trap
 S South
 N North

Comments on SCS Field Services Landfill Gas (LFG) Collection System Investigation
dated 06 May 2004.

1. The finding of 5.3 to 7.5 % Methane at Gas Monitoring Well G-1 (south of Floodwall) indicates that the landfill gas collection system is not functioning as designed and requires immediate corrective action.
2. Data indicates that there is a high pressure drop in the blower suction line. The blower is operating at 46.7 inches water column vacuum. The north and south gas headers inside the blower house a few feet away are at 20 inches water column vacuum. The cause of this high pressure drop (26.7 inches water column) should be determined and corrected. It is possible that the inline filter and flame arrestors require maintenance.
3. The inline filter is designed to protect the blower from foreign material. It should only have a few inches of water column pressure drop during normal operation. The filter element probably should be replaced.
4. The flame arresters were designed to prevent the propagation of an external flame through the pipeline to protect equipment and personnel. Flame arrestors typically contain wound, crimped 316 stainless steel foil strips designed to extinguish a flame. It is possible that over time these strips have become clogged. Flame arrestors normally have a low pressure drop (2-3 inches of water column). These flame arrestors should be disassembled, inspected, and the internal foil strips replaced as required.
5. The LFG would have to be in the flammable range and a source of ignition also would have to be present for a fire to occur. Since the methane content at the LFG wells and in the North and South Header are all less than the lower flammable limit, these flame arrestors may no longer be required.
6. Gas Extraction Wells #4, 19, 20, 21, 28, 29, and 30 were found to be under surface water or have internal water levels high enough to flood the gas collection screens and render the wells ineffective.
7. Moisture Traps 01 to 15 have minimal vacuum. Moisture Trap 15 is not draining (3.5 feet to liquid inside the well).
8. Recommendations:
 - a. Determine whether the gas extraction wells and moisture traps are in the vadose zone or are simply waterlogged by an ineffective drainage system. Any redesign of the system should consider the level of the water table when designing of LFG condensate collection and drainage system.
 - b. Correct the high pressure drop problem in the pump house to reestablish higher vacuum levels in the north and south headers.
 - c. Gas Extraction Wells and Moisture Traps should be immediately pumped to try to reestablish vacuum at these locations.
 - d. Repair or replace the LFG Collection System as required.

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R. A. Miller

Don Sammons
Loy. so Melisizwe

IN THE MATTER OF:

Lee's Lane Superfund Site,
Jefferson County, Kentucky

LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

and

JEFFERSON COUNTY, KENTUCKY

Respondents

ADMINISTRATIVE ORDER
ON CONSENT

U. S. EPA Docket No. 91-32-C

I. JURISDICTION

This Administrative Order on Consent ("Consent Order") is issued pursuant to the authority vested in the President of the United States by Sections 104(a) and 122(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 42 U.S.C. §§ 9604(a) and 9622(a), (hereinafter "CERCLA" or the "Act") and the authority vested in the Administrator of the United States Environmental Protection Agency ("EPA") by Section 122(h) of the Act, 42 U.S.C. § 9622(h). The authority vested in the President has been delegated to the Administrator of the United States Environmental Protection Agency ("EPA") by Executive Order 12580, 52 Fed. Reg. 2923 (January 29, 1987) and further delegated to the Regional Administrators of the EPA by Delegation No. 14-14-C

-2-

(September 13, 1987). The authority vested in the Administrator of the EPA by Section 122(h) of CERCLA has been delegated to the Regional Administrators of the EPA by EPA Delegation No. 14-14-D (September 13, 1987).

This Administrative Order on Consent is issued to the Louisville and Jefferson County Metropolitan Sewer District and to Jefferson County, Kentucky ("Respondents"). Respondents agree to undertake all actions required by the terms and conditions of this Consent Order. Respondents further consent to and will not contest EPA's jurisdiction to issue this Consent Order or to implement or enforce its terms.

II. DEFINITIONS

Unless noted to the contrary, the terms of this Consent Order shall have the same meaning as terms defined in CERCLA. Whenever the following terms are used in this Consent Order and the Attachments hereto, the following definitions specified in this Section shall apply:

A. "Attachment I" shall mean the "Operations and Maintenance Plan for Post-Removal Site Control at the Lee's Lane Landfill Site, Louisville, Kentucky" attached hereto and incorporated herein.

B. "CERCLA" or the "Act" means the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601 et seq.

C. "EPA" means the United States Environmental Protection Agency.

D. "Future Response Costs" means any and all response costs which may be incurred by EPA after the effective date of this Consent Order in connection with the Site.

E. "National Contingency Plan" or "NCP" means the National Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, including any amendments thereto.

F. "Parties" means the United States Environmental Protection Agency and Respondents.

G. "Past Response Costs" means all response costs incurred by EPA in connection with the Site prior to the effective date of this Consent Order.

H. "Response Costs" means any costs incurred by EPA pursuant to CERCLA.

I. "Respondents" means the Louisville and Jefferson County Metropolitan Sewer District ("MSD"), and its successors and assigns, and Jefferson County, Kentucky, and its successors and assigns.

J. "Site" means the "facility" as that term is defined at Section 101(9) of CERCLA, 42 U.S.C. §9601(9), encompassing the property commonly known as Lee's Lane Landfill, where hazardous substances have been disposed of and otherwise have come to be located. The Site is located approximately 4.4 miles southwest of Louisville, Kentucky, in Jefferson County, and is adjacent to the Ohio River.

K. "State" means the Commonwealth of Kentucky.

III. STATEMENT OF FACTS

A. Hazardous substances within the definition of Section 101(14) of CERCLA, 42 U.S.C. §9601(14) have been or are threatened to be released into the environment at or from the Site.

B. As a result of the release or threatened release of hazardous substances into the environment, EPA has undertaken response action at the Site under Section 104 of CERCLA, 42 U.S.C. §9604, and has determined that additional response action at the Site, as set forth in Attachment I, is necessary in order to protect human health and the environment.

C. EPA has incurred response costs and will continue to incur response costs in connection with the Site.

IV. DETERMINATIONS

Based upon the administrative record for this Site, EPA has determined that:

A. The Site as described in Section II of this Consent Order is a "facility" as that term is defined in Section 101(9) of CERCLA, 42 U.S.C. §9601(9).

B. Respondents are "persons" as that term is defined in Section 101(21) of CERCLA, 42 U.S.C. §9601(21).

C. MSD is a person who "arranged for disposal or treatment . . . of hazardous substances" at the Site within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. §9607(a)(3), and is a "potentially responsible party" within the meaning of Section

122(a) of CERCLA, 42 U.S.C. §9622(a). Pursuant to Kentucky law, Jefferson County must approve MSD's rates, rentals, and charges.

D. The past, present, or future migration of hazardous substances from the Site constitutes an actual or threatened "release" as that term is defined in Section 101(22) of CERCLA, 42 U.S.C. §101(22).

E. Settlement with Respondents and implementation of the response action required pursuant to this Consent Order are in the public interest.

V. ORDER

Based upon the administrative record for this Site and the Findings of Fact and Determinations set forth above, and in consideration of the promises and covenants set forth herein, it is hereby AGREED TO AND ORDERED:

PERFORMANCE OF THE WORK AND GENERAL PROVISIONS

1. Except as expressly provided herein, Respondents agree to perform all monitoring activities and operation and maintenance work set forth more specifically in Attachment I, entitled "Operations and Maintenance Plan for Post-Removal Site Control at the Lee's Lane Landfill Site, Louisville, Kentucky" incorporated herein. Respondents' obligations to perform the operation and maintenance work listed below shall be subject to a present value monetary cap of \$250,000 (two hundred and fifty thousand dollars):

- a. Repair or replacement of riprap;
- b. Repair or regrading of cracking, slumping, or other signs and effects of slope movement and installation

of equipment for measurement of slope movement;

- c. Installation of piezometers or excavation for the purpose of cleaning, repairing, or replacing all or any portions of the gas collection or water wells, adding to or extending existing manifold systems and wells, or installing new wells;
- d. Repair or replacement of the blower house, weather data collection stations, and gates and barriers;
- e. Repair of access road and on-site roadways;
- f. Repair or replacement of the clay cap;
- g. Replacement of blowers and pumps;
- h. Repair or replacement of any equipment damaged by vandalism;
- i. Repair of any conditions exposing hazardous substances, or drums and other similar containers which may contain hazardous substances, directly to the elements;
- j. Additional sampling (in excess of quarterly sampling) to verify unusual analytical results as required pursuant to the last sentence of Section 4.4.B (Groundwater Monitoring Frequency) of Attachment I; and
- k. Repairs or other activities undertaken to eliminate or reduce ponding of surface waters.

With respect to items a through k enumerated above, Respondents' obligations under this Consent Order shall cease when MSD demonstrates that it has expended the full amount of the monetary cap performing work on any or all of these items, or upon the termination date of this Consent Order as specified in Paragraph 40, whichever occurs first. In the event that MSD expends the full amount of the monetary cap on items a through k prior to the termination date of the Consent Order, nothing herein shall affect Respondents' obligations to continue to perform all other monitoring activities and operation and maintenance work set

forth in Attachment I, with the exception of items a through k, until the termination of the Consent Order as specified in Paragraph 40. MSD shall demonstrate that the full amount of the monetary cap has been expended by supplying EPA with invoices, cancelled checks, or other appropriate documentation of charges, costs, and payments, and documentation evidencing that such charges, costs, and payments were expended in performance of one or more of items a through k, along with calculations discounting such expenditures to 1991 dollars. MSD shall use its best efforts to control charges, costs, and payments to be expended in performance of items a through k.

2. All activities undertaken by Respondents pursuant to this Consent Order shall be conducted in accordance with the requirements of all applicable or relevant and appropriate local, state and federal laws and regulations. No permits shall be required for work conducted entirely on-site.

3. Respondents shall include in all contracts or subcontracts entered into for activities required under this Consent Order, provisions stating that such contractors or subcontractors, including their agents and employees, shall perform all activities required by such contracts or subcontracts in compliance with all applicable laws and regulations.

4. This Consent Order is not, nor shall it act as, nor is it intended by the Parties to be, a permit issued pursuant to any federal or state statute or regulation.

5. Within thirty days of the effective date of this Consent Order, Respondents shall record a notice of this Order with the Registry of Deeds, Jefferson County, Commonwealth of Kentucky.

ACCESS

6. To the extent that the Site or any other area where work is to be performed is owned or controlled by persons other than Respondents, Respondents shall use best efforts to assist EPA in obtaining access for Respondents, as well as for EPA and authorized representatives or agents of EPA, for the purposes of conducting any activity authorized by or related to this Consent Order, including, but not limited to:

- a. Monitoring the work described herein or any other activities taking place on the Site;
- b. Verifying any data or information submitted to EPA;
- c. Conducting investigations relating to any contamination which may exist at or near the Site;
- IWD* d. Obtaining samples;
- e. Assessing the need for or planning and implementing additional response actions at or near the Site; and
- f. Inspecting and copying records, operating logs, contracts, or other documents required to assess compliance with this Consent Order.

7. Notwithstanding any provision of this Consent Order, EPA retains all of its access authorities and rights under CERCLA, RCRA and any other applicable federal statute or regulation.

MSD COORDINATOR

8. Within twenty-(20) calendar days of the effective date of this Consent Order, Respondents shall notify EPA and the State in writing of the name, address and telephone number of MSD's designated coordinator for purposes of conducting the work described in Attachment I. If the identity of the coordinator initially designated is to be changed, the identity of the successor shall be given to EPA and the State within 5 working days before the change.

QUALITY ASSURANCE, SAMPLING

9. Respondents shall use quality assurance, quality control, and chain of custody procedures specified in Attachment I. Respondents shall assure that EPA and State personnel or authorized representatives are allowed access to any laboratory utilized by Respondents in implementing this Consent Order.

10. At the request of EPA or the State, Respondents shall allow split or duplicate samples to be taken by EPA or the State and/or their authorized representatives of any samples collected by Respondents pursuant to the implementation of this Consent Order. Respondents shall notify EPA in the manner provided in Paragraph 38 and the State not less than fourteen (14) days in advance of any sample collection activity. In addition, EPA and the State shall have the right to take any additional samples which EPA or the State deems necessary.

REPORTING REQUIREMENTS

11. Respondents shall submit to EPA and the State all results of sampling and tests and all other data received by Respondents during the course of the work described in Attachment I. These results shall be submitted to EPA no later than five (5) working days after receipt of the results or data by Respondents. Progress reports shall be submitted to EPA and the State as provided in Attachment I.

12. Upon the occurrence of any event during performance of the work described in Attachment I which, pursuant to Section 103 of CERCLA, requires reporting to the National Response Center, Respondents shall promptly orally notify the Emergency Response Section, Region IV, United States Environmental Protection Agency, in addition to the reporting required by Section 103.

APPROVAL OF CONTRACTORS

13. In the event that Respondents seek to retain a contractor to perform any portion of the sampling, analyses, or monitoring required pursuant to this Consent Order or Attachment I, Respondents shall notify EPA, in writing, of the name, title, and qualifications of such contractor and any subcontractor proposed to be used in carrying out such work. Selection of any such contractor or subcontractor shall be subject to approval by EPA. After receiving notice of the proposed contractor or subcontractor, EPA shall notify Respondents in writing within 21 calendar days of the approval or disapproval of such contractor

or subcontractor. If EPA disapproves of the selection of any contractor or subcontractor, Respondents shall submit a list of contractors and/or subcontractors to EPA within 21 days of receipt of the disapproval of the contractor or subcontractor previously selected. EPA shall, within 21 calendar days of receipt of the list, provide written notice of the names of the contractors or subcontractors that EPA approves. Respondents may at its election select any one from that list. After selection of the contractor and/or subcontractor, Respondents shall notify EPA of the name of the contractor and/or subcontractor within 14 calendar days.

INDEMNIFICATION AND INSURANCE

14. Respondents shall indemnify and save and hold harmless EPA and its officials, agents, employees, contractors, or representatives from any and all claims or causes of action arising from or relating to any acts or omissions of Respondents, its officers, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control in the performance of any response actions relating to the Site or arising from any failure by Respondents to perform fully or complete the requirements of this Consent Order. EPA shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Consent Order. Neither Respondents nor any such contractor shall be considered an agent of EPA.

15. Respondents shall indemnify and hold EPA harmless with respect to any claims for damages or reimbursement from EPA arising from or on account of any contract, agreement, or arrangement between Respondents and any person for performance of work on or relating to the Site.

16. Prior to commencing any on-site work, Respondents shall secure and maintain for the duration of this Consent Order, comprehensive general liability and automobile insurance pursuant to the self-insurance program evidenced by the certificates attached as Attachment II. In addition, for the duration of this Consent Order, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of workmen's compensation insurance for all persons performing work on behalf of Respondents in furtherance of this Consent Order.

FORCE MAJEURE

17. "Force Majeure" is defined for the purposes of this Consent Order as an event arising from causes entirely beyond the control of Respondents and of any entity controlled by Respondents including their contractors and subcontractors, which delays or prevents the performance of any obligation under this Consent Order and which could not have been overcome by due diligence. "Force Majeure" does not include unanticipated or increased costs, changed financial circumstances, or failure to obtain necessary permits unless all reasonable and timely efforts have been made to obtain such permits.

18. When circumstances occur which indicate that a delay may occur or that the completion of any portion of the work or access to the Site may be prevented, whether or not caused by a Force Majeure event, Respondents shall notify orally the Director of the Waste Management Division, EPA Region IV and the State of the circumstances within forty-eight hours after they first become aware of them. Within ten (10) working days after Respondents first become aware of such circumstances, Respondents shall supply to EPA and the State in writing an explanation of the cause(s) of any actual or expected delay or noncompliance, the anticipated duration of any delay, the measures taken and to be taken by Respondents to prevent or minimize the delay or correct the noncompliance, and the timetable for implementation of such measures. Failure to give timely oral and written notice to EPA or the State in accordance with this Paragraph shall constitute a waiver of Respondents' right to assert Force Majeure in a dispute resolution proceeding pursuant to Paragraphs 21 through 22 herein.

19. In proceedings on any dispute regarding a delay in performance or other noncompliance, Respondents shall have the burden of proving that the delay or noncompliance is or was caused by a Force Majeure event.

DISPUTE RESOLUTION

20. Any dispute which arises under or with respect to this Consent Order shall in the first instance be the subject of informal negotiations between the Parties. The period for such

informal negotiations shall not exceed sixty (60) days from the time the dispute arises, except when extended by agreement between the Parties. The period for informal negotiations shall end when EPA provides its position on the disputed matter to the Respondents in writing and notifies Respondents that the informal negotiation period has ended.

21. In the event that the Parties cannot resolve a dispute by informal negotiations under the preceding paragraph, then the position advanced by EPA shall be considered binding unless, within ten working (10) days after the end of the informal negotiation period, the Respondents invoke the dispute resolution procedures herein by serving on EPA a written statement of its position on the matter in dispute ("Statement of Position"), including factual data, analysis, or opinions supporting that position and supporting documentation relied upon. EPA may serve a Statement of Position, including supporting documentation, on Respondents no later than thirty (30) days after receipt of Respondents' Statement of Position. In the event that these periods for exchange of Statements of Position may delay the work, they may be shortened upon and in accordance with notice by EPA.

22. Upon review of the Statements of Position, and any other materials submitted pursuant to the request of the Director of the Waste Management Division, EPA Region IV (the "Director"), the Director shall issue a final decision resolving the dispute. This decision shall not be subject to judicial review.

23. The dispute resolution procedures set forth in Paragraphs 20 through 22 herein shall be the exclusive mechanism to resolve disputes arising under or with respect to this Consent Order and shall apply to all provisions of this Consent Order unless otherwise expressly provided. Invocation of these procedures shall not of itself extend or postpone any obligation of Respondents under this Consent Order, provided that payment of stipulated penalties with respect to the disputed matter shall be stayed pending resolution of the dispute. Notwithstanding the stay of payment, stipulated penalties shall accrue from the date of demand as specified in Paragraph 25. In the event that the Respondents do not prevail on the disputed issue, stipulated penalties shall be assessed and paid as provided in Paragraphs 24 through 26 herein.

STIPULATED PENALTIES AND ASSUMPTION OF WORK BY EPA

24. If Respondents fail to comply with any requirement of this Consent Order, including failure to perform any portion of the work set forth in Attachment I in a timely or appropriate manner, Respondents shall pay to EPA stipulated penalties in the following amounts for each day of each and every violation of said requirements:

<u>Period of Delay</u>	<u>Penalty Per Violation Per Day</u>
1st through 14th day	\$ 3,000
15th through 30th day	\$ 6,000
Beyond 30 days	\$10,000

25. Stipulated penalties shall begin to accrue on the day that EPA makes written demand for payment of stipulated penalties

upon Respondents, specifying the violation or violations for which stipulated penalties are due, and shall continue to accrue through the final day of correction of the violation. Separate penalties shall accrue for each separate violation of this Consent Order.

26. All penalties due to EPA shall be payable within thirty (30) days of receipt by Respondents of EPA's written demand for payment of stipulated penalties. Interest shall begin to accrue on the unpaid balance at the end of the thirty-day period, at the rate established pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a). Notwithstanding the foregoing, no violation shall be deemed to have occurred and Respondents shall not be required to make payment if, within twenty (20) days of receipt of EPA's written demand, Respondents fully correct the violations specified by EPA in the written demand.

27. In the event EPA determines that Respondents have failed to implement the work required pursuant to this Consent Order or any portion thereof in a timely manner, the EPA or its designate may perform such portions of the work as EPA deems necessary. Prior to such performance, the EPA will provide the MSD Project Coordinator with 30 days advance notice of intent to perform a portion or all of the work. In the event that EPA or its designate assumes the performance of a portion or all of the work, any liability of Respondents for stipulated penalties arising from the acts or omissions that prompted EPA's performance of the work shall run only until ten (10) days after

commencement of the work, or a portion thereof, by the EPA or its designate. In the event that EPA has not made written demand for payment of such stipulated penalties before providing notice of EPA's intent to perform the work, such stipulated penalties shall be paid 30 days after the EPA provides notice of intent to perform a portion or all of the work. If EPA or its designate performs any portion of the work because of Respondents' failure to comply with its obligations under this Order, Respondents shall reimburse EPA for the costs of doing such work within 60 days of receipt of demand for payment of such costs.

28. Any payments due to EPA shall be paid by certified check made payable to "EPA Hazardous Substance Superfund" and shall be mailed to EPA-Region IV, Attention: Superfund Accounting, P.O. Box 100142, Atlanta, Georgia, 30384.

29. The stipulated penalties set forth above shall be in addition to any other remedies or sanctions which may be available to EPA by reason of Respondents' failure to comply with the requirements of this Consent Order. Nothing herein shall be construed as a waiver of EPA's right to seek penalties under Section 122(1) of CERCLA, provided that if EPA elects to proceed under Section 122(1) of CERCLA, it shall not seek stipulated penalties in addition to statutory penalties.

EFFECT OF SETTLEMENT

30. Respondents' agreement to and execution of this Consent Order shall, upon the effective date specified in Paragraph 39

hereto, constitute full satisfaction of EPA's claim against MSD for Past Response Costs.

31. Subject to the reservations of rights in Paragraph 32, EPA covenants not to sue Respondents in any civil or administrative proceeding for performance of the monitoring activities and operation and maintenance work required pursuant to this Consent Order. This covenant not to sue is conditioned upon satisfactory performance of said monitoring activities and operation and maintenance work by Respondents and shall take effect upon satisfactory completion of all such work by Respondents. This covenant not to sue extends only to Respondents and their officers and employees and does not extend to any other person.

32. EPA reserves, and this Consent Order is without prejudice to, all rights against Respondents with respect to all matters other than those expressly specified in Paragraph 30 and the covenant not to sue set forth in Paragraph 31, including but not limited to:

- (1) claims based on a failure by Respondents to meet a requirement of this Consent Order;
- (2) claims for reimbursement of Future Response Costs;
- (3) claims for injunctive relief for the performance of response actions other than the response actions required under this Consent Order;
- (4) claims for damages for injury to, destruction of, or loss of natural resources;

(5) any matter as to which EPA is owed

indemnification under Paragraphs 14 and 15 herein;

and

(6) any criminal liability.

33. Notwithstanding any other provision of this Consent Order, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

CONTRIBUTION PROTECTION

34. Subject to the reservations of rights in Paragraph 32 and upon the effective date of this Consent Order specified in Paragraph 39, EPA agrees that by entering into this Consent Order, MSD will have resolved its liability to EPA for those matters set forth in Paragraph 30 pursuant to Sections 113(f) and 122(h) of CERCLA, and shall not be liable for claims for contribution for those matters. Further, subject to the reservations of rights in Paragraph 32, EPA agrees that by entering into and carrying out the terms of this Consent Order, MSD will have resolved its liability to EPA for those matters set forth in the covenant not to sue in Paragraph 31, pursuant to Section 113(f) of CERCLA, and shall not be liable for claims for contribution for those matters.

COVENANT BY RESPONDENTS

35. Respondents hereby covenant not to sue EPA or its representatives for any claims related to or arising from this Consent Order or the work required pursuant hereto, including any direct or indirect claim for reimbursement from the Hazardous

Substance Superfund established pursuant to Chapter 98 of the Internal Revenue Code, 26 U.S.C. § 9507.

COOPERATION AND ACCESS TO INFORMATION

36. Respondents shall provide to EPA all documents and information within their control or within the control of their contractors or agents relating to activities at the Site or to the implementation of this Consent Order, including sampling, analysis, chain of custody records, logs, receipts, reports, correspondence, or other documents or information related to activities at the Site. Respondents agree to cooperate and assist EPA in the prosecution of any actions relating to the Site against all persons or entities who are not parties to this Consent Order. Respondents' obligations of cooperation and assistance include, but are not limited to, naming fact witnesses with knowledge relating to the Site and producing those witnesses under Respondents' control for interviews, depositions, and trial; waiving the subpoena requirements for the depositions and trial testimony of such witnesses; producing documents requested; and promptly responding to requests for information regarding those matters specified in Section 104(e)(2) of CERCLA, 42 U.S.C. § 9604(e)(2). The benefit of said agreement by Respondents shall extend only to EPA and not to any other person. Nothing in this Paragraph shall be construed to limit or otherwise affect the exercise of EPA's prosecutorial discretion or any of EPA's authorities under Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). Further, nothing in this Paragraph shall be construed to alter

the scope of the covenants not to sue and reservations of rights set forth in Paragraphs 31 through 33 of this Consent Order.

RETENTION OF RECORDS

37. Until six (6) years after the termination of this Consent Order, Respondents shall preserve and retain all records and documents now in their possession or control that relate in any manner to the Site. After this document retention period, Respondents shall notify EPA at least ninety (90) calendar days prior to the destruction of any such records or documents, and, upon request by the EPA, Respondents shall relinquish custody of the records or documents to EPA.

NOTICES AND SUBMISSIONS

38. Whenever, under the terms of this Consent Order, written notice is required to be given or a report or other document is required to be sent by one party to another, it shall be directed to the individuals and the addresses specified below, unless those individuals or their successors give notice of a change to the other parties in writing. Written notice as specified herein shall constitute complete satisfaction of any written notice requirement of the Consent Order with respect to the parties hereto.

As to EPA:

Derek Matory, Project Manager
United States Environmental Protection Agency
Superfund---North Remedial Branch
345 Courtland St., N.E.
Atlanta, Ga. 30365

1- 404- 347- 7791

As to Respondents:

Executive Director
Louisville and Jefferson County Metropolitan Sewer District
400 S. Sixth Street
Louisville, Ky. 40202

EFFECTIVE AND TERMINATION DATES

39. The effective date of this Consent Order shall be the date upon which EPA issues written notice to the Respondents that the public comment period pursuant to Paragraph 43 of this Consent Order has closed and that comments received, if any, do not require modification of this Consent Order.

40. This Consent Order shall terminate upon notice by EPA to Respondents that the work required pursuant to this Consent Order has been satisfactorily completed. EPA shall make such determination within ninety (90) days of the twenty-ninth annual anniversary of the effective date of this Consent Order. Termination of this Consent Order shall not affect the provisions of Paragraphs 30 and 34 or the covenants not to sue or the reservations of rights set forth in Paragraphs 31 through 33 and 35 above or the provisions relating to cooperation and retention of records set forth in Paragraphs 36 and 37 above.

MODIFICATION

41. No modification shall be made to this Consent Order without written approval of the Parties. No oral modification of this Consent Order shall be effective.

PARTIES BOUND

42. This Consent Order applies to and is binding upon the undersigned Parties, their employees and officers and their successors, assigns, contractors, and agents. Any change in the organization of the Respondents shall in no way alter their responsibility under this Order. Respondents shall provide a copy of this Consent Order to any contractor or subcontractor hired to perform the monitoring or operation and maintenance work required by this Consent Order and shall condition all contracts and subcontracts entered into hereunder upon performance of the work in conformity with the terms of this Consent Order.

PUBLIC COMMENT

43. This Consent Order shall be subject to a thirty-day public comment period in accordance with Section 122(i) of CERCLA, 42 U.S.C. § 9622(i). EPA reserves the right to withdraw or withhold its consent to this Consent Order if the comments received disclose facts or considerations which indicate that the Consent Order is inappropriate, improper, or inadequate. Respondents consent to the entry of this Consent Order without further notice.

ATTORNEY GENERAL APPROVAL

44. The Attorney General or his designee has issued prior written approval of this Consent Order in accordance with Section 122(h)(1) of CERCLA, 42 U.S.C. § 9622(h)(1).

SIGNATORIES

45. Each undersigned representative of a Party to this Consent Order certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Order and to execute and legally bind such Party to this document.

IT IS SO AGREED AND ORDERED:

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT

By: 

Its: Executive Director

6/11/91

[Date]

JEFFERSON COUNTY, KENTUCKY

By: 

Its: _____

6/28/91

[Date]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By: 

Its: Periz Dir. Waste Mgt Div.

7-16-91

[Date]